

TWO NEW TALL HERB COMMUNITIES WITH THE DOMINANT *LASERPITIUM SILER* AND *GRAFIA GOLAKA* FROM THE SE ALPS (NE ITALY, W SLOVENIA)

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Abstract

The article describes two new tall herb communities in the Southeastern Alps, *Centaureo julici-Laserpitietum sileris* and *Laserpitio sileri-Grafietum golakae*. Both are long-term successional stages in the overgrowing of abandoned hay meadows in the altimontane and subalpine belt of the southern and southwestern Julian Alps (including the Julian Prealps), partly also the Carnic Alps, that have been abandoned for over 50 years. In the succession sere where the altimontane-subalpine Illyrian beech forest (*Dentario pentaphylli-Fagetum*, *Ranunculo plataniifolii-Fagetum*, *Polysticho lonchitis-Fagetum*) is the potential natural vegetation on steep, sunny limestone (rarely dolomite) slopes, the species *Laserpitium siler* and (or) *Grafia golaka* act as inhibitors also due to their high allelopathic potential; in turn, spontaneous afforestation with spruce and some deciduous trees has been slow and gradual.

Key words: *Laserpitium siler*, *Grafia golaka*, synsystematics, syndynamics, the Julian Alps, the Carnic Alps, Slovenia, Italy, Natura 2000.

Izvešček

Opisujemo dve novi združbi visokih steblik v Jugovzhodnih Alpah, *Centaureo julici-Laserpitietum sileris* in *Laserpitio sileri-Grafietum golakae*. Obe sta dolgotrajen sukcesijski stadij pri zaraščanju nekdanjih in že več kot 50 let opuščeni senožeti v altimontanskem in subalpinskem pasu južnih in jugozahodnih Julijskih Alp (vključno z Julijskimi Predalpami) in deloma tudi Karnijskih Alp. V sukcesijskem nizu, v katerem je potencialno naravna vegetacija na strmih prisojnih apnenčastih (redkeje dolomitnih) pobočjih altimontansko-subalpinski ilirski bukov gozd (*Dentario pentaphylli-Fagetum*, *Ranunculo plataniifolii-Fagetum*, *Polysticho lonchitis-Fagetum*), vrsti *Laserpitium siler* in (ali) *Grafia golaka* tudi zaradi svojega močnega alelopatškega potenciala delujeta zaviralno in je zato zaraščanje s smrekjo in nekaterimi listavci počasno in postopno.

Ključne besede: *Laserpitium siler*, *Grafia golaka*, sinsistematika, sindinamika, Julijske Alpe, Karnijske Alpe, Slovenija, Italija, Natura 2000.

1. INTRODUCTION

Several years ago (Dakskobler 2003), we studied forest development on abandoned hay meadows in the southern Julian Alps. These hay meadows were cleared in the belt of the subalpine beech forest classified into the association *Polysticho lonchitis-Fagetum* and are gradually becoming overgrown, especially with spruce. Based on the floristic-phytosociological analysis of 23 relevés the

species-rich former hay-meadows were classified into the southeastern-Alpine alliance *Caricion austroalpinae* Sutter 1962 and, being a relatively long-term successional stage, described as a provisional new association *Centaureo julici-Laserpitietum sileris* nom. prov. Subsequent research conducted in the various parts of the Julian Alps (the upper Bača Valley, the Breginjski Stol ridge, the valleys of Bala and Loška Koritnica) confirmed our decision for an independent association as

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these stands form a physiognomically (in their appearance) and floristically distinct community that can be spatially delimited and is relatively long-standing due to the slow rate of spontaneous afforestation. Latest research (comp. Kaligarič et al. 2011) has shown a strong allelopathic potential of *Laserpitium siler*, which in addition to other factors (snowslides) inhibits successional development back towards forest. A brief report on similar fringe communities from the Italian part of the Julian Alps and the Carnic Alps was published several years ago (Poldini 2003). A comparison of the collected relevé material from the whole region (W Slovenia and NE Italy) facilitated the typification of two new associations, *Centaureo julici-Laserpitietum sileris* and *Laserpitio sileri-Grafietum golakae*.

2. METHODS

We inventoried the abandoned grasslands in the upper montane and subalpine belt (900 to 1900 m a.s.l.) in the western, southern and southwestern part of the Julian Alps (Figure 1) and partly also

in the Carnic Alps. Phytosociological records were made according to the standard Central-European phytosociological method (Braun-Blanquet 1964) and entered into the FloVegSi database (Seliškar et al. 1993). Relevés from the Slovenian part of the Julian Alps (some of which have already been published as a separate subassociation *Centaureo julici-Laserpitietum sileris asphodelotosum albi* nom. prov. – Dakskobler et al. 2007) were combined with the relevés of slightly similar stands in NE Italy: the Carnic Alps: M. Chiadin – Sappada, M. Talm, the western Julian Alps: Val Raccolana, the Julian Prealps: Mt. Matajur, the Stol ridge / Gran Monte: Punta Lausciovizza / Lanževica; M. Cuarnan / Mali Karman, the Muzci ridge / Cime del Monte Musi: M. Cadin. Combined cover-abundance values were transformed into numerical values (1–9) according to van der Maarel (1979). Numerical comparisons were performed with the SYN-TAX 2000 program package (Podani 2001). The relevés were compared by means of “(unweighted) average linkage method” – UPGMA, “Incremental sum of squares method” – MISSQ and principal coordinates analysis (PCoA). Wishart’s similarity

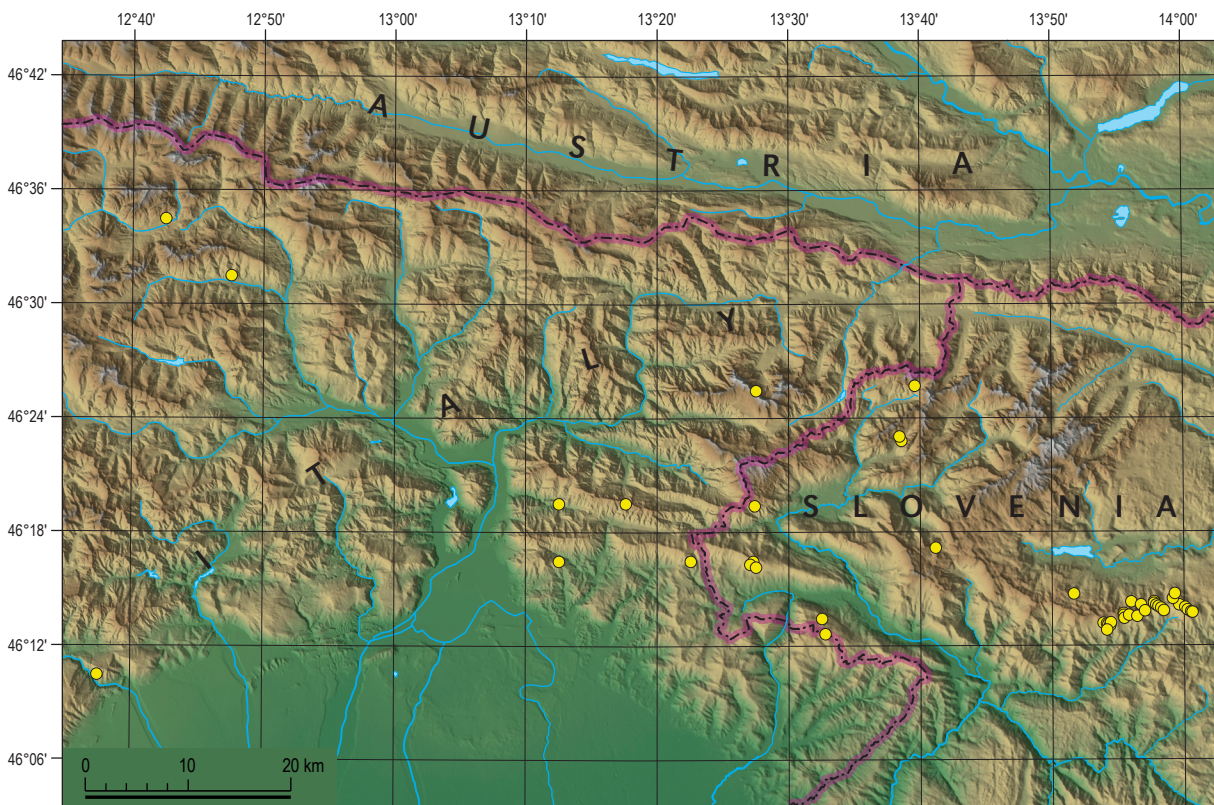


Figure 1: Research area with approximate localities of relevés in scale 1: 500 000 (Map source: Jarvis & al. 2008).

Slika 1: Raziskovano območje s približno lokacijo popisov v merilu 1: 500 000 (vir za zemljevid: Jarvis & al. 2008).

ratio was used in all of the methods. The nomenclature source for the names of vascular plants is the Mala flora Slovenije (Martinčič et al. 2007) – except for the taxa *Knautia ressmannii* (Pacher) Briq. and *Bupleurum ranunculoides* subsp. *caricinum* (DC.) Arcang. – and Martinčič (2003) for the names of mosses. The nomenclature of the syntaxa follows Šilc & Čarni (2012). In the classification of species into phytosociological groups (groups of diagnostic species) we mainly refer to the Flora alpina (Aeschimann et al. 2004 a, b, c). Coordinates of relevés are determined according to the Slovenian geographic coordinate system D 48 (5th zone) on the Bessel ellipsoid and with Gauss-Krüger projection.

3. ECOLOGICAL DESCRIPTION OF THE STUDY AREA

The predominant geological bedrock in the research area is limestone, in places admixed with marlstone and chert, rarely with dolomite. The soils are shallow fresh rendzinas, very rarely brown soils. Potential natural vegetation of the researched part of the Julian Alps is mainly beech forest classified into the associations *Ranunculo platanifolii-Fagetum*, *Dentario pentaphylli-Fagetum* and *Polysticho lonchitis-Fagetum*; the grasslands above the upper timberline are classified into the associations *Avenastro parlatorei-Festucetum calvae* and *Ranunculo hybridi-Caricetum sempervirentis*. The climate is relatively warm and very humid and mean annual precipitation usually exceeds 2500 mm. The slopes are mainly sunny and open to the influence of the Adriatic Sea (for more information on the climate of the study area see Dakskobler 2003, Čušin 2006, Gobbo & Poldini 2005).

4. RESULTS AND DISCUSSION

Firstly, we compared 87 relevés of stands with dominant *Laserpitium siler* and (or) *Grafia golaka* in the Julian Alps and their foothills (the so-called Julian Prealps) and the Carnic Alps – Figures 2 and 3. Stands with the dominant *Grafia golaka* from the Julian Prealps (Mt. Matajur, the Stol ridge / Gran Monte and the Muzci ridge / Cime del Monte Musi) clearly separated from the stands with the dominant *Laserpitium siler* from the western and southern Julian Alps and the Carnic Alps. Four main groups in the den-

drogram (Figure 2) were interpreted as: 1 *Centaureo julici-Laserpitietum sileris typicum*, 2 *Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*, 3 *Centaureo julici-Laserpitietum sileris asphodeletosum albi* and 4 *Laserpitio sileri-Grafietum golakae*. Two-dimensional scatter-diagram (Figure 3) on the first axis partly indicates the phytogeographical gradient and on the second axis the altitudinal gradient. This comparison formed the basis for the analytic tables (Tables 1, 2, 3, 4). The first table comprises typical stands of the association *Centaureo julici-Laserpitietum sileris*, Table 2 encompasses fringe stands of this association which indicate possible transitions to similar tall herb and mountain grassland communities (for the time being treated as a variant *Centaureo julici-Laserpitietum sileris typicum* var. *Brachypodium rupestre*), the third table comprises subalpine stands with the dominant *Laserpitium siler* from NE Italy (*Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*) and the fourth table the stands with the dominant *Grafia golaka* (*Laserpitio sileri-Grafietum golakae*).

The second step was to make a synoptic table (Table 5) into which we classified the above four syntaxa, the relevés of the subassociation *Centaureo julici-Laserpitietum sileris asphodeletosum albi* nom. prov. (Dakskobler et al. 2007, Tab. 1, relevés 8–33) and two similar fringe communities from central and southeastern Slovenia: *Scabioso hlanikianae-Grafietum golakae* Čarni 2007 from the Polhov Gradec Hills (Čarni 2007) and *Laserpitietum sileris* Springer 1987 var. geogr. *Dianthus croaticus* from the Gorjanci hills (Čarni et al. 2005). Some of the communities with the dominant *Laserpitium siler*, e.g. *Carici humilis-Centaureetum rupestris* Ht. 1931 *laserpitietosum sileris* Kaligarič & Poldini 1997 (Kaligarič 1997, Kaligarič & Poldini 1997), *Libanotido-Laserpitietum sileris* van Gils et al. 1975 (van Gils et al. 1975, Čarni 1997), *Laserpitio-Festucetum alpestris* Pedrotti 1970 (Pedrotti 1970), *Origano-Calamagrostietum variae* Lippert ex Thiele 1978 (Grabherr et al. 1993: 431–433) and *Laserpitio-Seslerietum* Moor 1957 (Oberdorfer 1978, Ewald 1996), were not included in our comparison as they are either communities of a different altitudinal belt (submontane, lower montane) and (or) communities of a phytogeographically entirely different environment and subsequently clearly floristically different.

Some of the species common to all of the compared communities are *Laserpitium siler*, *L. latifolium*, *Polygonatum odoratum*, *Silene nutans* s. lat.,

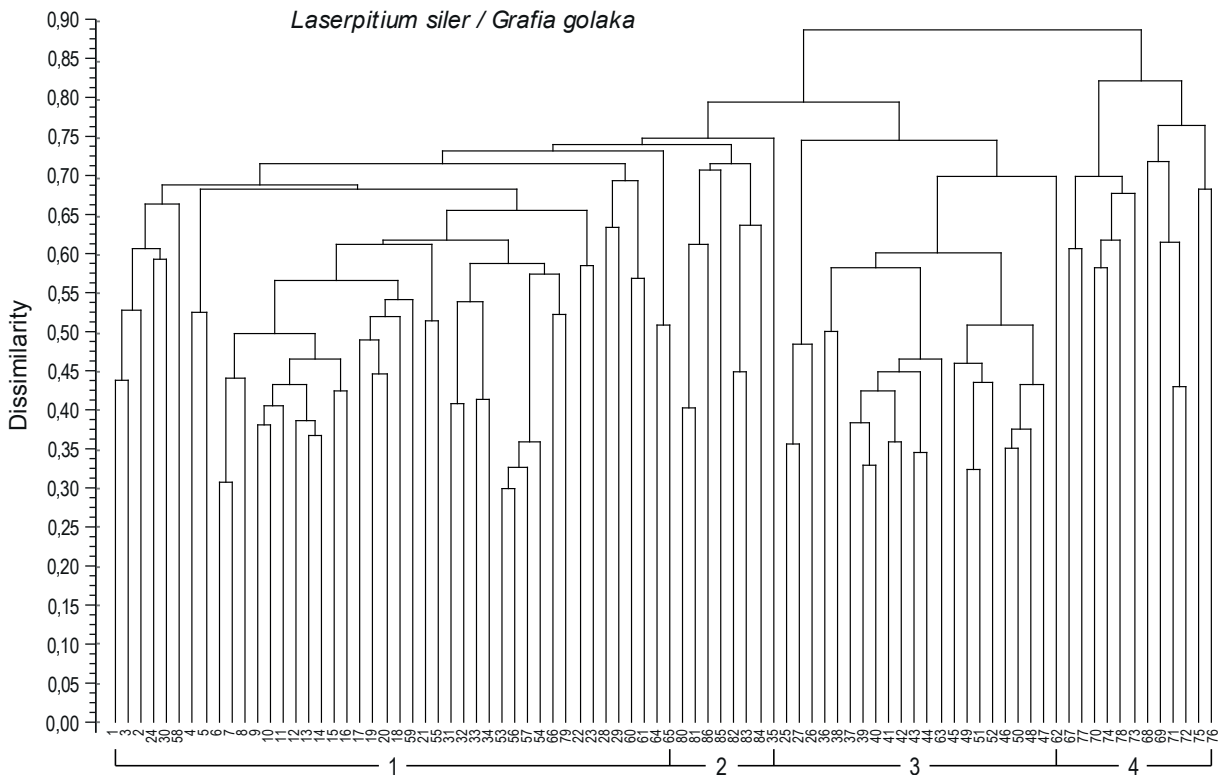


Figure 2: Dendrogram of tall herb communities with dominant *Laserpitium siler* or *Grafia golaka* in the Julian and Carnic Alps (NE Italy, W Slovenia) – UPGMA, similarity ratio (1 *Centaureo julici-Laserpitietum sileris typicum*, 2 *Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*, 3 *Centaureo julici-Laserpitietum sileris asphodeletosum albi*, 4 *Laserpitio sileri-Grafietum golakae*).

Slika 2: Dendrogram združb visokih steblik z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v Julijskih in Karnijskih Alpah (severovzhodna Italija, zahodna Slovenija) – UPGMA, similarity ratio (1 *Centaureo julici-Laserpitietum sileris typicum*, 2 *Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*, 3 *Centaureo julici-Laserpitietum sileris asphodeletosum albi*, 4 *Laserpitio sileri-Grafietum golakae*).

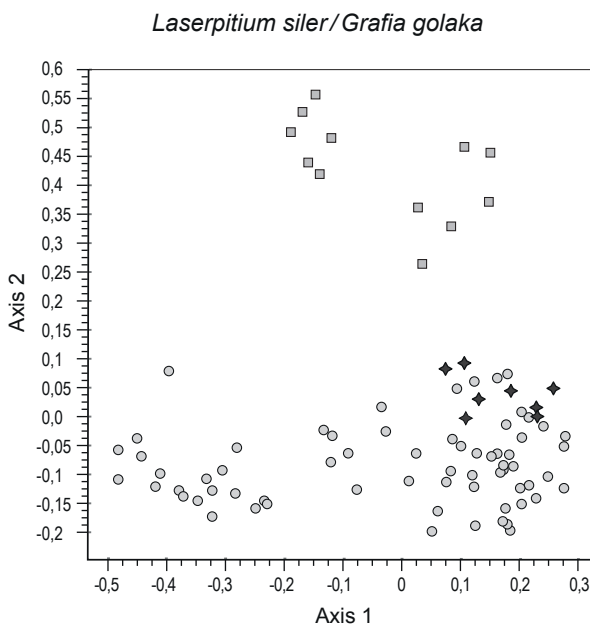


Figure 3: Two-dimensional scatter-diagram of tall herb communities with dominant *Laserpitium siler* or *Grafia golaka* in the Julian and Carnic Alps (NE Italy and W Slovenia) – PCoA, similarity ratio (○ – *Centaureo julici-Laserpitietum sileris* – W Slovenia, ◆ – *Centaureo julici-Laserpitietum sileris* – NE Italy, ■ – *Laserpitio sileri-Grafietum golakae*).

Slika 3: Dvorazsežni ordinacijski diagram združb visokih steblik z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v Julijskih in Karnijskih Alpah (severovzhodna Italija, zahodna Slovenija) – PCoA, similarity ratio (○ – *Centaureo julici-Laserpitietum sileris* – zahodna Slovenija, ◆ – *Centaureo julici-Laserpitietum sileris* – severovzhodna Italija, ■ – *Laserpitio sileri-Grafietum golakae*).

Buphthalmum salicifolium, *Koeleria pyramidata* s. lat., *Cirsium erisithales*, *Carlina acaulis* s. lat. and *Centaurea triumfettii*. Differential species of the first main cluster are *Bromopsis transilvanica*, *Laserpitium peucedanoides* and *Festuca calva*. Differential species of the second main cluster are *Scabiosa hladnikiana*, *Tephrosia longifolia*, *Prunella vulgaris*, *Mercurialis ovata*, *Betonica officinalis*, *Salvia pratensis* and *Euphorbia verrucosa*. Differential species of the first four syntaxa (*Centaureo julici-Laserpitietum sileris* s. lat.) are *Gentiana lutea* subsp. *symphyandra*, *Serratula tinctoria* subsp. *macrocephala*, *Prunella grandiflora*, for the typical geographical variant also *Arabis pauciflora*. Comparison of the syntaxa from the synthetic table (Table 5) clearly demonstrates that these are different communities (Fig-

ures 4 and 5). Stands of the association *Centaureo julici-Laserpitietum sileris* are distinctly different from the stands of the association *Laserpitietum sileris* and the stands of the association *Laserpitio sileri-Grafietum golakae* differ from the stands of the association *Scabioso hladnikiana-Grafietum golakae*. The differences are due to a different altitudinal belt and different potential natural vegetation. In terms of the association *Laserpitietum sileris* on the Gorjanci hills potential natural vegetation consists of submontane–montane beech forests from the associations *Hacquetio-Fagetum*, *Arunco-Fagetum* and *Cardamino savensi-Fagetum*; the stands of the association *Scabioso hladnikiana-Grafietum golakae* occur on the fringes of forest communities from the associations *Ostryo-Fagetum*, *Arunco-*

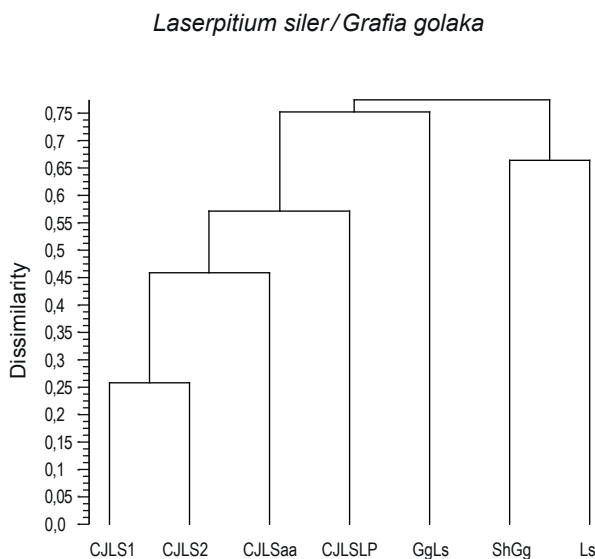


Figure 4: Dendrogram of tall herb and fringe communities with dominant *Laserpitium siler* or *Grafia golaka* in NE Italy and Slovenia – UPGMA, similarity ratio.

Slika 4: Dendrogram združb visokih steblik in gozdnih robov z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v severovzhodni Italiji in Sloveniji – UPGMA, similarity ratio.

Legend to Figure 4 and 5

- CJLS1 *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *typicum* – the Julian Alps, Slovenia
 CJLS2 *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *typicum* var. *Brachypodium rupestre* – the Julian Alps, Slovenia
 CJLSaa *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *asphodeletosum albi* subss. nov. – the Julian Alps, Slovenia (Dakskobler et al. 2007, table 1, rel. 8–33)
 CJLSLP *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco var. geogr. *Pedicularis elongata* – the Carnic and W Julian Alps, NE Italy
 GgLS *Laserpitio sileri-Grafietum golakae* ass. nov. hoc loco – the Julian Prealps, NE Italy
 ShGg *Scabioso hladnikiana-Grafietum golakae* Čarni 2007 – central Slovenia (Čarni 2007, Table 1)
 LS *Laserpitietum sileris* Springer 1987 var. geogr. *Dianthus croaticus* – southeastern Slovenia (Čarni et al. 2005, Tab. 1, rel. 47–56)

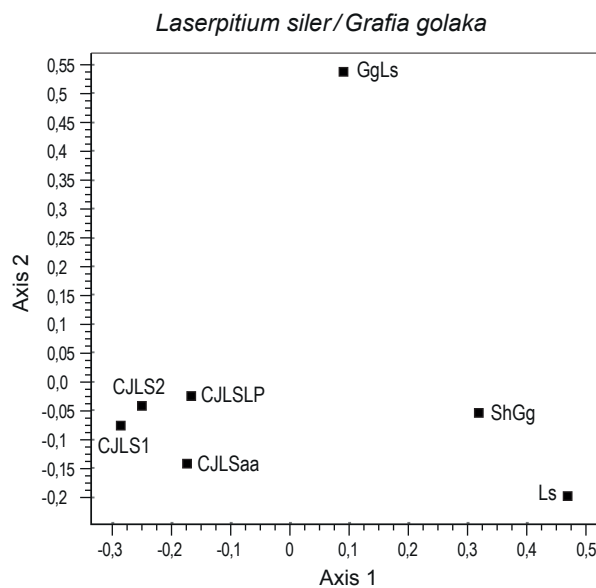


Figure 5: Two-dimensional scatter-diagram of tall herb and fringe communities with dominant *Laserpitium siler* or *Grafia golaka* in NE Italy and Slovenia – PCoA, similarity ratio.

Slika 5: Dvorazsežni ordinacijski diagram združb visokih steblik in gozdnih robov z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v severovzhodni Italiji in Sloveniji – PCoA, similarity ratio.

Fagetum and *Quercus-Ostryetum*; contact meadow communities (*Scabioso hladnikiana-Caricetum humilis*) are classified into the alliance *Bromion erecti*. Significant differences are demonstrated also by the comparison of the composition according to phytosociological groups (groups of diagnostic species) – Table 6. Stands of the typical form of the association *Centaureo julici-Laserpitietum sileris* are dominated by the species of subalpine-alpine grasslands and swards (*Caricion austroalpinae*, *Elyno-Seslerietea*), followed by the species from classes *Festuco-Brometea* and *Trifolio-Geranietea*. Stands of the subassociation *Centaureo julici-Laserpitietum sileris asphodeletosum albi* already have a predominant proportion of the species of classes *Festuco-Brometea* and *Trifolio-Geranietea*. Subalpine stands with the dominant *Laserpitium siler* from the Carnic Alps and the western Julian Alps are very similar to other stands of the association *Centaureo julici-Laserpitietum sileris* from the southern and southwestern Julian Alps (see Figures 2, 3, 4 and 5); however, *Centaurea haynaldii* subsp. *julica* was not recorded there. These stands have a relatively large proportion of *Erico-Pinetea* species, indicating dolomite bedrock. The dominating species in the stands of the association *Laserpitio sileri-Grafietum golakae* are those of the class *Festuco-Brometea*, followed by the species of the classes *Mulgedio-Aconitetea* and *Trifolio-Geranietea*. Stands of the associations *Scabioso-Grafietum* and *Laserpitietum sileris* are clearly dominated by the species of the class *Festuco-Brometea*, followed by those from the class *Trifolio-Geranietea*. There is also a large proportion of the species of the class *Erico-Pinetea*, at least in the stands of the association *Scabioso-Grafietum*. Čarni (2005, 2007) classifies the associations *Scabioso-Grafietum* and *Laserpitietum sileris* into the class *Trifolio-Geranietea*, order *Origanetalia vulgaris*, alliance *Geranion sanguinei* and suballiance *Geranienion sanguinei*. In our opinion, the proportion and abundance of diagnostic species of subalpine grasslands in the stands of the association *Centaureo julici-Laserpitietum sileris* is still considerable enough for this association to be classified into the alliance *Caricion austroalpinae* and class *Elyno-Seslerietea*. Preserved grasslands that are still mown are rare in this altitudinal belt and their floristic composition features relatively equal proportions of species from the classes *Elyno-Seslerietea* and *Festuco-Brometea*. This classification is somewhat questionable only for the stands in the lower altitudinal belt of their distribution, at 1100 to 1300 m a.s.l. (subassociation *Centaureo*

julici-Laserpitietum sileris asphodeletosum albi); alternatively, they could also be classified into the class *Trifolio-Geranietea*. In our opinion, classification of the association *Laserpitio sileri-Grafietum golakae* into higher syntaxonomic units should be subject to the consideration of phytosociological affinity of *Grafia golaka*. According to Poldini (1991: 399) *Grafia golaka* is a species of montane pastures, while Aeschimann et al. (2004 a: 1104) consider it a diagnostic species of the alliance *Calamagrostion arundinaceae* Oberdorfer 1950, i.e. a character species of thermo-hygrophilous montane-subalpine tall herb communities of the class *Mulgedio-Aconitetea*. Wraber (1990: 93) mentions its frequent occurrence on secondary montane pastures under the ridge of Breginjski Stol and in forest fringe communities in the belt of black hornbeam and flowering ash, as well as in the beech belt. Under the Stol and Muzci ridges *Grafia golaka* often thrives also in subalpine beech stands from the association *Polysticho lonchitis-Fagetum*. On its classic locality under Golaki *Grafia golaka* grows on very stony sites in natural clearings and in shrub stands with dominant *Salix appendiculata* and *Rhododendron hirsutum* (*Rhododendro hirsuti-Salicetum appendiculatae* nom. prov.) in the belt of subalpine beech forest (*Polysticho lonchitis-Fagetum*) – Table 7. *Grafia golaka* is therefore diagnostic for the tall herb communities from the class *Mulgedio-Aconitetea* and for the forest fringe communities from the class *Trifolio-Geranietea*. In our case, *Laserpitio sileri-Grafietum golakae* is a montane-subalpine community, so a more appropriate classification would be into the class *Mulgedio-Aconitetea* and into the alliance *Calamagrostion arundinaceae*.

Systematic classification and typification of the described new syntaxa is the following:

Elyno-Seslerietea Br.-Bl. 1948

Seslerietalia albicantis Br.-Bl. in Br.-Bl. & Jenny 1926 corr. Oberd. 1983

Caricion austroalpinae Sutter 1962

Centaureo julici-Laserpitietum sileris Daks-kobler in Daks-kobler & Poldini ass. nov. hoc loco

The nomenclatural type, *holotypus*, is relevé No. 13 in Table 1.

Diagnostic species of the association: *Laserpitium siler*, *L. latifolium* (dominant

species of the community), *Serratula tinctoria* subsp. *macrocephala* (= *S. tinctoria* subsp. *monticola*), *Lilium carnolicum*, *Gentiana lutea* subsp. *symphiandra*, *Carduus crassifolius*, *Centaurea haynaldii* subsp. *julica* (= *C. jacea* subsp. *julica* = *C. julica*) and *Laserpitium peucedanoides* (with their mainly eastern-Alpine or southeastern-Alpine-Illyrian distribution the last five species characterize the new association also phytogeographically).

Centaureo julici-Laserpitietum sileris typicum

The nomenclatural type, *holotypus*, is relevé No. 13 in Table 1.

Centaureo julici-Laserpitietum sileris typicum var. *Brachypodium rupestre* var. prov.

Centaureo julici-Laserpitietum sileris asphodelosum albi subass. nov. hoc loco

The nomenclatural type, *holotypus*, is relevé No. 15 in Table 1 (Daksobler et al. 2007: 172–178).

The differential species is *Asphodelus albus*.

Centaureo julici-Laserpitietum sileris var. geogr. *Pedicularis elongata*

Differential species of the geographical variant are *Pedicularis elongata*, *Knautia ressmannii* and *Euphorbia triflora* subsp. *kernerii*.

Mulgedio-Aconitetea Hadač & Klika in Klika & Hadač 1944

Calamagrostietalia villosae Pawłowski in Pawłowski, Sokolowski et Wallisch 1928 (sin. *Adenostyletalia alliariae* G. & J. Br.-Bl. 1931)

Calamagrostion arundinaceae Oberdorfer 1950

Laserpitio sileri-Grafietum golakae Poldini in Daksobler & Poldini ass. nov. hoc loco.

The nomenclatural type, *holotypus*, is relevé No. 9 in Table 4.

Diagnostic species: *Grafia golaka*, *Laserpitium siler* (dominant species; the first with its southeastern-European montane distribution characterizes the association also phytogeographically), *Molopospermum peloponnesiacum* subsp. *bauhinii* and *Laserpitium peucedanoides* (geographical differential species).

4. CONCLUSIONS

The steep, sunny slopes of the southern and southwestern Julian Alps on the natural timberline are mainly dominated by beech. In the past, subalpine beech stands were often cleared for hay meadows. These have been abandoned for more than half a century and are gradually becoming overgrown with spruce, in places also with Austrian (black) pine, hazel and other deciduous trees. Abandoned hay meadows are dominated by tall herbs, especially *Laserpitium siler* and *L. latifolium*, in some localities in the Julian Prealps (the Stol ridge / Gran Monte, the Muzci ridge / Cime del Monte Musi) also by *Grafia golaka*. Considerable allelopathic potential has been determined for these species and this, in addition to other factors such as snowslides, slows down the succession process. Relatively long-term stages are physiognomically distinct; they can be clearly spatially delimited and should preferably be treated at the syntaxonomic level of association. We therefore described two new associations, *Centaureo julici-Laserpitietum sileris* (presented in more detail but without a valid description some years ago – Daksobler 2003, Daksobler et al. 2007) and *Laserpitio sileri-Grafietum golakae*. Despite some similarities they are two syndynamically different communities. In terms of succession, the first is becoming gradually overgrown by pioneer subalpine spruce stands (*Adenostylo glabrae-Piceetum* sensu Zupančič = *Homogyno sylvestris-Piceetum* sensu Exner – see Daksobler 2003), while spontaneous afforestation in the second community proceeds through shrubs *Rubus idaeus*, *Salix appendiculata* and deciduous tree species (*Sorbus aria*, *S. aucuparia*, *Acer pseudoplatanus*, in places also *Ostrya carpinifolia*, *Amelanchier ovalis*), and only rarely through *Picea abies* or *Pinus nigra*. The newly described associations therefore belong to different classes, the first to the class of subalpine-alpine grasslands, and the second to the class of montane and subalpine tall herb communities. The stands of both, but especially those of the first association, *Centaureo julici-Laserpitietum sileris*, are characterised by a species-rich composition and a diverse mixture of diagnostic species of montane and subalpine grasslands, forest fringes and tall herbs. They are a site of some rare and protected plants, such as *Eryngium alpinum*, *Asphodelus albus* and *Iris sibirica* subsp. *erirrhiza*, an important habitat type for some birds, e.g. corncrake (*Crex crex*), and in some areas (e.g. on the slopes of the Stol ridge) also a habitat type of European conservation concern.

5. POVZETEK

Dve novi združbi visokih steblik z dominantnima vrstama *Laserpitium siler* in *Grafia golaka* v Jugovzhodnih Alpah (severovzhodna Italija, zahodna Slovenije)

Pred nekaj leti (Dakskobler 2003) smo preučevali razvoj gozda na nekdanjih senožetih v južnih Julijskih Alpah. Te senožeti so bile izkrcene v pasu subalpinskega bukovega gozda in smo jih kot razmeroma dolgotrajen sukcesijski stadij opisali kot provizorno novo asociacijo *Centaureo julici-Laserpitietum sileris* nom. prov. Kasnejše raziskave v različnih delih Julijskih Alp (zgornja Baška dolina, greben Breginjskega Stola, dolini Bale in Loške Koritnice) so pokazale, da je bila naša odločitev za samostojno asociacijo upravičena, saj ti sestoji oblikujejo fiziognomsko (po zunanem videzu) in floristično jasno prepoznavno združbo, ki jo je moč dobro prostorsko omejiti in ki je zaradi počasnega zaraščanja razmeroma dolgotrajna. Novejše raziskave (prim. Kaligarič et al. 2011) kažejo na močan alelopatski potencial vrste *Laserpitium siler*, kar poleg drugih dejavnikov (snežni plazovi) zavira sukcesijski razvoj nazaj v gozd. Naredili smo precej dodatnih popisov in jim pridružili popise nekoliko podobnih sestojev v italijanskem delu Julijskih Alp in deloma tudi v Karnijskih Alpah. Primerjava zbranega popisnega gradiva je omogočila tipizacijo dveh novih asociacij, *Centaureo julici-Laserpitietum sileris* in *Laserpitio sileri-Grafietum golakae*.

Fitocenološke popise smo naredili po standardni srednjeevropski fitocenološki metodi (Braun-Blanquet 1964). Zbrane popise smo vnesli v bazo podatkov FloVegSi (Seliškar et al. 1993) in jih numerično obdelali s programskim paketom SYN-TAX 2000 (Podani 2001). V prvem koraku smo med seboj primerjali 87 popisov sestojev z dominantnima vrstama *Laserpitium siler* in *Grafia golaka* v Julijskih Alpah, vključno s prigorjem (t. i. Julijske Predalpe), in Karnijskih Alpah – sliki 2 in 3. Sestoji z dominantno vrsto *Grafia golaka* iz Julijskih Predalp so se jasno razlikovali od sestojev z dominantno vrsto *Laserpitium siler* iz Julijskih in Karnijskih Alp. Na podlagi tega smo izdelali štiri analitske tabele (tabele 1, 2, 3, 4). V prvi so tipični sestoji asociacije *Centaureo julici-Laserpitietum sileris*, v tabeli 2 robni sestoji te asociacije, ki kažejo na mogoče prehode k podobnim združbam visokih steblik in gorskih travnišč (začasno jih vrednotimo kot varianto *Centaureo julici-Laserpitietum sileris typicum* var. *Brachypodium rupestre*), v tretji

tabeli so sestoji z dominantno vrsto *Laserpitium siler* iz severovzhodne Italije (*Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*) in v četrti tabeli sestoji z dominantno vrsto *Grafia golaka* (*Laserpitio sileri-Grafietum golakae*).

V drugem koraku smo izdelali sintezno tabelo (tabela 5), v katero smo poleg zgornjih štirih sintaksonov uvrstili še popise subasociacije *Centaureo julici-Laserpitietum sileris asphodeletosum albi* nom. prov. (Dakskobler et al. 2007, tab. 1, popisi 8–33) in dve podobni robni združbi iz osrednje in jugovzhodne Slovenije: *Scabioso hladnikiana-Grafietum golakae* Čarni 2007 iz Polhograjskega hribovja (Čarni 2007) in *Laserpitietum sileris* Springer 1987 var. geogr. *Dianthus croaticus* z Gorjancev (Čarni et al. 2005).

Primerjava sintaksonov iz sintezne tabele (tabela 5) jasno kažejo, da gre za različne združbe (sliki 4 in 5). Sestoji asociacije *Centaureo julici-Laserpitietum sileris* se očitno razlikujejo od sestojev asociacije *Laserpitietum sileris* in sestoji asociacije *Laserpitio sileri-Grafietum golakae* od sestojev asociacije *Scabioso hladnikiana-Grafietum golakae*. Razlike temeljijo na drugačnem višinskem pasu in drugačni potencialno naravni vegetaciji. Očitne razlike kaže tudi primerjava sestave po fitocenoloških skupinah (skupinah diagnostičnih vrst) – Tabela 6. V sestojih nove asociacije *Centaureo julici-Laserpitietum sileris* (nomenklturni tip, *holotypus*, je fit. popis št. 13 v tabeli 1) je delež diagnostičnih vrst subalpinskih travnišč še tolikšen, da je smiselna uvrstitev te asociacije v zvezo *Caricion austroalpinae* in v razred *Elyno-Seslerietea*. Za uvrstitev nove asociacije *Laserpitio sileri-Grafietum golakae* (nomenklturni tip, *holotypus*, je popis št. 9 v tabeli 4) v višje sintakonomske enote je odločilna presoja, za katere združbe je značilna *Grafia golaka*. Uspeva tako v združbah visokih steblik iz razreda *Mulgedio-Aconitetea* kot v združbah gozdnih robovih iz razreda *Trifolio-Geranietea*. V našem primeru je *Laserpitio sileri-Grafietum golakae* montansko-subalpinska združba, zato je bolj ustrezna uvrstitev v razred *Mulgedio-Aconitetea* in v zvezo *Calamagrostion arundinaceae*.

Za sestoje obeh novo opisanih asociacij, še posebej prve, *Centaureo julici-Laserpitietum sileris*, je značilna bogata vrstna sestava in pisana zmes diagnostičnih vrst montanskih in subalpinskih travnišč ter gozdnih robov in visokih steblik. So življenjski prostor nekaterih redkih in zavarovanih rastlin, npr. alpske možine (*Eryngium alpinum*), zlatega korena *Asphodelus albus* in kojniške perunike (*Iris sibirica* subsp. *erirrhiza*), pomem-

ben habitatni tip za nekatere ptice, npr. za kosca (*Crex crex*) in na nekaterih območjih (npr. pobočja Stolovega grebena) tudi evropsko varstveno pomemben habitatni tip.

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Pr.	Fr.				
Number of relevé (Zapored. štev. popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31 <td>Pr.<td>Fr.</td> </td>	Pr. <td>Fr.</td>	Fr.				
Diagnostic species of the association (Diagnostične vrste asociacije)																																						
TG	<i>Laserpitium siler</i>	E1	+	4	5	4	3	4	4	5	3	4	2	4	4	4	4	4	3	4	4	4	4	3	3	4	3	3	3	3	3	3	3	4	31	100		
ES	<i>Carduus crassifolius</i>	E1	.	+	1	1	1	1	+	+	+	+	+	1	1	1	+	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28	90	
CA	<i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	26	84		
ES	<i>Serratula tinctoria</i> subsp. <i>macrocephala</i>	E1	3	3	+	2	1	2	+	+	+	+	1	1	1	1	1	1	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	23	74
TG	<i>Laserpitium latifolium</i> (subsp. <i>asperum</i>)	E1	1	+	.	.	+	1	.	.	+	.	4	2	3	3	2	+	1	1	+	.	.	.	.	1	1	1	1	1	2	.	+	21	68		
TG	<i>Lilium carniolicum</i>	E1	.	.	.	+	.	.	+	+	+	+	+	+	1	.	+	1	1	1	.	+	+	+	.	1	1	1	1	+	.	+	+	19	61			
CA	<i>Gentiana lutea</i> subsp. <i>synphyandra</i>	E1	.	.	+	.	.	.	.	+	.	2	2	2	2	2	1	+	+	1	1	+	+	+	.	.	.	.	1	.	.	.	.	17	55		
CA	<i>Laserpitium peucedanoides</i>	E1	.	.	.	.	.	.	.	.	1	1	+	1	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	32	
CA Caricion austroalpinae																																						
	<i>Festuca calva</i>	E1	.	.	+	1	2	1	1	.	.	2	.	.	.	.	+	.	.	.	.	1	.	.	.	.	.	+	3	+	1	2	2	16	52		
	<i>Scorzonera rosea</i>	E1	.	+	.	.	+	.	.	.	.	.	+	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	32
	<i>Allium ericetorum</i>	E1	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	29
	<i>Asperula aristata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	23
	<i>Linum julicum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	16
	<i>Pedicularis elongata</i> subsp. <i>julica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
	<i>Gentiana lutea</i> subsp. <i>varjani</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Heracleum austriacum</i> subsp. <i>stifolium</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
ES Elyno-Seslerietea																																						
	<i>Betonica alopecuroides</i>	E1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	97		
	<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	3	3	3	1	2	2	1	2	2	1	3	2	1	2	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	29	94	
	<i>Helianthemum nummularium</i> subsp. <i>grandiflorum</i>	E1	.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27	87	
	<i>Scabiosa lucida</i> subsp. <i>stricta</i>	E1	1	1	+	1	1	1	+	+	+	+	+	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	77	
	<i>Carex sempervirens</i>	E1	+	.	.	.	.	1	.	+	1	2	1	1	2	1	1	2	+	+	3	1	1	.	.	.	1	1	1	1	1	1	1	1	1	20	65
	<i>Phyteuma orbiculare</i>	E1	+	+	+	+	+	+	20	65
	<i>Campanula witasekiana</i>	E1	+	.	.	.	.	+	.	.	.	.	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	19	61	
	<i>Phleum hirsutum</i>	E1	+	1	+	1	+	+	14	45
	<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	+	.	.	.	.	+	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	13	42
	<i>Pulsatilla alpina</i> subsp. <i>austroalpina</i>	E1	+	.	.	.	.	.	.	.	1	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	13	42	
	<i>Leucanthemum adustum</i>	E1	.	+	1	1	.	.	+	12	39
	<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	+	+	+	12	39
	<i>Cerastium strictum</i>	E1	+	.	+	.	.	+	10	32
	<i>Ranunculus montanus</i>	E1	+	+	9	29
	<i>Acinos alpinus</i>	E1	+	9	29
	<i>Anthyllis vulneraria</i> subsp. <i>alpestris</i>	E1	+	9	29
	<i>Galium anisophyllum</i>	E1	+	9	29
	<i>Rhinanthus aristatus</i>	E1	+	1	8	26
	<i>Globularia cordifolia</i>	E1	6	19
	<i>Astrantia bavarica</i>	E1	1	+	5	16

Number of relevé (Zapored. štev. popisa)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Pr. Fr.			
<i>Stachys recta</i> agg.	E1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	+	.	+	+	1	.	.	.	.	+	+	+	.	.	9	29		
<i>Hippocrepis comosa</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	7	23	
<i>Allium senescens</i>	E1	.	.	.	.	.	.	1	.	.	1	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	1	.	.	.	.	.	6	19
<i>Briza media</i>	E1	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	1	+	.	.	.	.	6	19
<i>Galium lucidum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	1	1	+	1	+	1	6	19
<i>Arabis hirsuta</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	4	13
<i>Allium carinatum</i> subsp. <i>pulchellum</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
<i>Teucrium chamaedrys</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	.	.	.	.	3	10
<i>Cuscuta epithymum</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	6
<i>Orobancha gracilis</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	2	6
<i>Euphorbia cyparissias</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	.	.	.	2	6
<i>Helictotrichon praeustum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	6
<i>Thymus pulegioides</i>	E1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
<i>Dactylorhiza sambucina</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
<i>Brachypodium rupestre</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
<i>Carlina vulgaris</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	1	3
<i>Plantago media</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	3
<i>Peucedanum oreoselinum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	3
<i>Trifolium montanum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	3
<i>Teucrium montanum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	3
<i>Polygala comosa</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
<i>Pimpinella saxifraga</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	1	3
<i>Salvia pratensis</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
<i>Sanguisorba minor</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
TG Trifolio-Geranietea																																			
<i>Thalictrum minus</i>	E1	1	+	.	+	1	+	+	.	.	.	.	+	.	.	+	1	.	+	+	+	r	+	1	.	+	.	.	.	.	.	21	68	
<i>Polygonatum odoratum</i>	E1	.	1	.	1	.	.	1	+	.	.	.	.	.	.	.	1	+	.	.	.	.	1	1	.	.	1	1	+	.	.	.	17	55
<i>Silene nutans</i>	E1	1	15	48
<i>Iris graminea</i>	E1	.	.	1	.	1	+	+	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14	45
<i>Arabis pauciflora</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	13	42
<i>Tanacetum corymbosum</i> agg. (<i>T. elusii</i> ?)	E1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	29
<i>Vicia sylvatica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9	29
<i>Anthericum ramosum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	26
<i>Libanotis sibirica</i> subsp. <i>montana</i>	E1	1	1	+	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	26
<i>Valeriana collina</i> (<i>V. wallrothii</i>)	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	7	23
<i>Vincetoxicum hircundinaria</i>	E1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	2	2	.	.	7	23
<i>Verbascum lanatum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	19
<i>Clinopodium vulgare</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	16
<i>Trifolium rubens</i>	E1	.	.	.	.	.	.	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	16
<i>Orobancha laserpitii-sileris</i>	E1	.	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	r	3	10

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Pr. Fr.					
Number of relevé (Zapored. štev. popisa)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Pr. Fr.					
TA	<i>Acer pseudoplatanus</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	
	<i>Hesperis candida</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Euphorbia amygdaloides</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Galium laevigatum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Poa nemoralis</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Lathyrus vernus</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Salvia glutinosa</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Scrophularia nodosa</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	QP	<i>Quercetalia pubescentis</i>																																				
		<i>Peucedanum schottii</i> var. <i>schottii</i>	E1	13	42
	<i>Convallaria majalis</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	13
	<i>Primula veris</i> subsp. <i>columnnae</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	13
	<i>Carex flacca</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
	<i>Sorbus aria</i>	E2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	10
	<i>Melittis melissophyllum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	6
	<i>Ostrya carpinifolia</i>	E2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
QF	<i>Quercus-Fagetum</i>																																					
	<i>Anemone nemorosa</i>	E1	5	16
	<i>Carex digitata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	16
	<i>Listera ovata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	13
	<i>Dactylorhiza fuchsii</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Corylus avellana</i>	E2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	<i>Cruciatia glabra</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
RP	<i>Rhamno-Prunetea</i>																																					
	<i>Rosa canina</i>	E1	1	3
	<i>Rosa glauca</i>	E2	1	3
O	Other species (Druge vrste)																																					
EA	<i>Rubus idaeus</i>	E2	3	10
	<i>Juniperus communis</i>	E2	2	6
	<i>Hieracium</i> sp.	E1	1	3
	<i>Poa</i> sp.	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
SM	<i>Myosotis arvensis</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
EA	<i>Fragaria vesca</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
M	Mosses (Mahovi)																																					
	<i>Tortella tortuosa</i>	E0	3	10
	<i>Schistidium apocarpum</i>	E0	1	3

A Limestone (apnenc), D Dolomite (dolomit), R Chert (roženec), L Marl (laporovec), Gr Gravel (pobočni grušč), Re Rendzina (rendzina), Li Lithosol (kamnišče)

Table 2: *Centaureo julici-Laserpitietum sileris typicum* var. *Brachypodium rupestre* – the Julian Alps, Slovenia.**Table 2:** *Centaureo julici-Laserpitietum sileris typicum* var. *Brachypodium rupestre* – Julijske Alpe, Slovenija.

Number of relevé	1	2	3	4	5	6	7	8	9	10	11	12			
Working number of relevé	202687	213088	202942	208444	202689	202690	208407	212047	203494	203670	203672	203671			
Altitude in m	1400	1510	1510	1300	1410	1440	1520	1600	1430	1130	1260	1100			
Aspect	SW	SW	S	SW	S	S	S	SE	SSE	SW	SSW	SSW			
Slope in degrees	40	30	35	40	35	40	35	10	30	30	30	25			
Parent material	AR	AG	A	ALR	ALR	ALR	A	A	AR	A	Gr	Gr			
Soil	R	E	R	R	R	R	Li	R	R	R	R	R			
Stoniness in %	0	0	5	0	10	10	20	0	10	5	5	5			
Cover of shrub layer in %	E2	0	0	0	10	1	0	10	10	0	0	2			
Cover of herb layer in %	E1	100	100	100	100	100	90	100	90	100	100	100			
Number of species	56	60	60	49	52	49	57	41	72	81	69	73			
Relevé area	m ²	50	20	20	20	10	50	50	15	50	50	50			
Date of taking relevé		7/17/2002	7/13/2005	6/11/2003	7/16/2004	6/17/2002	6/17/2002	7/21/2004	8/9/2006	8/29/1991	8/8/1997	8/8/1997	8/8/1997		
Locality		Slatnik	Črna prst - Štuke	Šoštar - Blehe	Kobla - Krevle	Kobla - Krevle	Kobla - Krevle	Črna gora - Home	Lisec	Šoštar	Breginjski Stol	Breginjski Stol	Breginjski Stol		
Quadrant		9750/3	9749/4	9749/4	9749/4	9749/4	9749/4	9749/4	9749/4	9749/4	9746/2	9746/2	9746/2		
Coordinate Y (Gauß-Krüger, D 48)	m	423441	418288	419008	419975	419914	419941	418633	417654	418779	381129	380938	380753		
Coordinate X (Gauß-Krüger, D 48)	m	121188	120754	121305	121808	121923	121940	121821	122136	120865	126361	126670	126492		
Diagnostic species of the association													Pr.	Fr.	
CA <i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	1	1	1	1	+	+	+	+	+	1	+	+	12	100
TG <i>Laserpitium siler</i>	E1	+	.	+	2	1	2	3	3	1	1	1	2	11	92
ES <i>Serratula tinctoria</i> subsp. <i>macrocephala</i>	E1	2	3	1	3	1	1	.	1	.	1	+	+	10	83
TG <i>Laserpitium latifolium</i> (subsp. <i>asperum</i>)	E1	2	2	.	1	1	2	1	.	+	3	2	+	10	83
ES <i>Carduus crassifolius</i>	E1	+	.	+	.	.	.	+	+	.	1	2	1	7	58
CA <i>Laserpitium peucedanoides</i>	E1	+	+	1	+	r	.	.	.	+	.	.	.	6	50
TG <i>Lilium carniolicum</i>	E1	.	.	+	.	.	.	+	.	.	1	+	+	5	42
CA <i>Gentiana lutea</i> subsp. <i>symphyandra</i>	E1	.	.	.	+	.	.	.	+	.	1	2	.	4	33
CA <i>Caricion austroalpinæ</i>															
<i>Festuca calva</i>	E1	.	.	+	.	.	.	+	.	+	1	1	2	6	50
<i>Scorzonera rosea</i>	E1	+	+	1	+	1	1	.	.	.	.	.	.	6	50
<i>Allium ericetorum</i>	E1	.	.	.	.	.	+	.	.	1	+	+	.	4	33
<i>Asperula aristata</i>	E1	.	.	.	.	.	.	.	.	+	+	+	+	4	33
<i>Linum julicum</i>	E1	.	.	+	+	.	.	.	.	.	.	.	.	2	17
<i>Heracleum austriacum</i> subsp. <i>siifolium</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	1	8
<i>Pedicularis elongata</i> subsp. <i>julica</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	1	8
ES <i>Elyno-Seslerietea</i>															
<i>Betonica alopecurus</i>	E1	1	1	+	1	+	1	1	1	1	1	1	1	12	100
<i>Phyteuma orbiculare</i>	E1	+	+	+	+	+	+	+	.	+	.	+	.	9	75
<i>Helianthemum nummularium</i> subsp. <i>grandiflorum</i>	E1	.	.	+	+	+	+	+	+	+	.	.	+	9	75
<i>Scabiosa lucida</i> subsp. <i>stricta</i>	E1	.	.	+	1	+	1	+	r	.	1	2	1	9	75

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	Pr.	Fr.
<i>Campanula witasekiana</i>	E1	+	+	+	.	.	+	.	.	+	+	+	+	8	67
<i>Phleum hirsutum</i>	E1	+	.	+	.	+	.	.	+	+	1	1	1	8	67
<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	.	1	+	1	+	.	.	.	+	+	.	+	7	58
<i>Leucanthemum adustum</i>	E1	.	.	+	.	.	+	+	.	+	+	+	.	6	50
<i>Pulsatilla alpina</i> subsp. <i>austroalpina</i>	E1	+	+	1	.	.	+	+	.	.	.	.	.	5	42
<i>Carex sempervirens</i>	E1	.	+	1	.	+	+	.	.	.	.	.	.	4	33
<i>Galium anisophyllum</i>	E1	.	+	+	+	.	.	.	.	.	.	r	.	4	33
<i>Anthyllis vulneraria</i> subsp. <i>alpestris</i>	E1	.	.	+	.	.	.	+	.	.	+	+	.	4	33
<i>Carex ferruginea</i>	E1	.	.	+	2	.	.	1	.	+	.	.	.	4	33
<i>Hieracium villosum</i>	E1	.	.	+	.	.	r	+	.	.	+	.	.	4	33
<i>Astragalus penduliflorus</i>	E1	.	.	.	2	+	+	.	.	1	.	.	.	4	33
<i>Campanula thyrsoidea</i>	E1	.	.	.	.	.	.	.	.	+	+	+	+	4	33
<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	+	.	.	.	.	.	+	+	.	.	.	.	3	25
<i>Anemone narcissiflora</i>	E1	.	+	+	.	.	.	+	.	.	.	.	.	3	25
<i>Polygonum viviparum</i>	E1	.	.	+	+	+	.	.	.	.	.	.	.	3	25
<i>Rhinanthus aristatus</i>	E1	.	.	.	.	.	.	.	+	+	.	.	2	3	25
<i>Acinos alpinus</i>	E1	.	+	.	.	.	.	.	.	.	.	.	+	2	17
<i>Bartsia alpina</i>	E1	.	+	+	.	.	.	.	.	.	.	.	.	2	17
<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	.	.	+	.	.	.	.	.	1	.	.	.	2	17
<i>Astrantia bavarica</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Crepis bocconi</i>	E1	.	.	1	.	.	.	.	.	.	.	.	.	1	8
<i>Ranunculus montanus</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	1	8
<i>Carduus defloratus</i>	E1	.	.	.	.	.	.	1	.	.	.	.	.	1	8
<i>Thesium alpinum</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	1	8
<i>Cerastium strictum</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	1	8
<i>Pimpinella alpina</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	1	8
FB Festuco-Brometea															
<i>Bromopsis transsilvanica</i>	E1	1	2	3	2	+	.	+	.	1	+	1	1	10	83
<i>Buphthalmum salicifolium</i>	E1	1	+	+	1	.	.	1	+	1	+	+	1	10	83
<i>Carlina acaulis</i>	E1	+	+	+	+	+	+	.	.	+	+	+	+	10	83
<i>Cirsium erisithales</i>	E1	2	+	.	1	+	+	1	1	+	.	+	.	9	75
<i>Koeleria pyramidata</i> (s. lat.)	E1	.	2	+	.	+	.	.	.	+	2	1	2	7	58
<i>Brachypodium rupestre</i>	E1	2	.	.	.	.	+	.	.	1	2	3	+	6	50
<i>Dianthus monspessulanus</i>	E1	+	+	.	.	.	.	.	.	1	2	2	2	6	50
<i>Campanula glomerata</i>	E1	+	.	.	+	.	.	.	.	+	+	+	+	6	50
<i>Centaurea triumfettii</i>	E1	.	+	+	.	+	.	.	.	.	+	+	+	6	50
<i>Gymnadenia conopsea</i>	E1	.	+	+	+	+	+	.	.	+	.	.	.	6	50
<i>Prunella grandiflora</i>	E1	.	.	.	+	.	+	+	.	+	+	+	.	6	50
<i>Briza media</i>	E1	+	+	.	.	.	.	.	.	.	+	+	1	5	42
<i>Carex humilis</i>	E1	.	1	.	1	.	.	.	.	1	1	.	+	5	42
<i>Linum viscosum</i>	E1	+	.	.	1	.	.	.	.	+	+	.	.	4	33
<i>Iris sibirica</i> subsp. <i>erirrhiza</i>	E1	.	+	.	.	+	+	.	.	.	.	.	.	3	25
<i>Trifolium montanum</i>	E1	.	+	.	.	.	.	.	.	.	.	+	+	3	25
<i>Helictotrichon praestum</i>	E1	.	.	.	.	.	.	.	.	.	1	1	2	3	25
<i>Galium verum</i>	E1	.	.	.	.	.	.	.	.	.	1	1	1	3	25
<i>Inula hirta</i>	E1	.	.	.	.	.	.	.	.	.	1	+	+	3	25
<i>Allium carinatum</i> subsp. <i>carinatum</i>	E1	.	.	.	.	.	.	.	.	.	+	+	+	3	25
<i>Cirsium pannonicum</i>	E1	.	.	.	.	.	.	.	.	.	+	+	+	3	25
<i>Galium lucidum</i>	E1	.	.	.	.	.	.	.	.	.	1	.	2	2	17
<i>Peucedanum oreoselinum</i>	E1	.	.	.	.	.	.	.	.	.	+	.	+	2	17
<i>Plantago media</i>	E1	.	.	.	.	.	.	.	.	.	+	.	+	2	17
<i>Veronica teucrium</i>	E1	.	.	.	.	.	.	.	.	.	+	.	+	2	17
<i>Helianthemum nummularium</i> subsp. <i>obscurum</i>	E1	.	.	.	.	.	.	.	.	.	.	1	1	2	17
<i>Thlaspi praecox</i>	E1	1	.	.	.	.	.	.	.	.	.	.	.	1	8

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	Pr.	Fr.
<i>Allium carinatum</i> subsp. <i>pulchellum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
<i>Thymus pulegioides</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
<i>Hippocrepis comosa</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
<i>Sanguisorba minor</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
<i>Hypochoeris maculata</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	1	8
<i>Cirsium x linkianum</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	1	8
<i>Silene vulgaris</i> subsp. <i>vulgaris</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	1	8
<i>Teucrium chamaedryx</i>	E1	.	.	.	.	.	.	.	.	.	.	.	2	1	8
<i>Euphorbia cyparissias</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
<i>Asperula cynanchica</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
<i>Veronica barrelieri</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
<i>Stachys recta</i> agg.	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
TG <i>Trifolio-Geranietea</i>															
<i>Arabis pauciflora</i>	E1	.	+	+	+	1	1	1	+	+	1	+	1	11	92
<i>Tanacetum corymbosum</i> agg. (<i>T. clusii</i> ?)	E1	1	+	+	1	+	+	.	.	+	+	.	.	8	67
<i>Libanotis sibirica</i> subsp. <i>montana</i>	E1	.	1	+	1	+	+	.	.	.	+	+	+	8	67
<i>Thalictrum minus</i>	E1	1	1	.	.	1	2	.	.	.	1	+	+	7	58
<i>Trifolium rubens</i>	E1	+	.	.	+	+	.	.	.	+	1	+	1	7	58
<i>Iris graminea</i>	E1	.	.	.	1	1	1	.	+	.	+	.	+	6	50
<i>Polygonatum odoratum</i>	E1	.	.	.	.	+	.	.	.	.	+	1	+	4	33
<i>Achillea distans</i>	E1	.	.	.	.	.	+	.	.	.	+	1	+	4	33
<i>Vicia sylvatica</i>	E1	1	.	.	.	.	.	.	+	1	.	.	.	3	25
<i>Verbascum lanatum</i>	E1	+	.	.	.	.	.	.	.	.	r	+	.	3	25
<i>Geranium sanguineum</i>	E1	.	.	.	.	.	.	.	.	.	1	+	1	3	25
<i>Thesium bavarum</i>	E1	.	.	.	.	.	.	.	.	.	1	+	+	3	25
<i>Origanum vulgare</i>	E1	.	.	.	.	.	.	.	+	.	.	.	+	2	17
<i>Digitalis grandiflora</i>	E1	.	.	.	.	.	.	.	.	+	+	.	.	2	17
<i>Silene nutans</i>	E1	.	.	.	.	.	.	.	.	.	+	.	+	2	17
<i>Verbascum lychnitis</i>	E1	.	.	.	.	.	.	.	.	.	+	.	+	2	17
<i>Trifolium medium</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Anthericum ramosum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
<i>Hypericum perforatum</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
<i>Valeriana collina</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
<i>Vincetoxicum hirundinaria</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
PoT <i>Poo alpinae-Trisetalia</i>															
<i>Trollius europaeus</i>	E1	1	1	1	1	2	1	+	+	.	+	.	.	9	75
<i>Festuca nigrescens</i>	E1	1	1	1	1	1	.	.	.	.	1	1	+	8	67
<i>Anthoxanthum odoratum</i>	E1	+	1	+	.	+	.	.	.	.	1	1	1	7	58
<i>Ranunculus nemorosus</i>	E1	+	.	1	+	.	.	+	.	.	+	+	+	7	58
<i>Pimpinella major</i> subsp. <i>rubra</i>	E1	+	.	.	1	+	.	.	.	+	.	.	.	4	33
<i>Crocus albiflorus</i>	E1	r	+	+	.	.	.	.	.	.	.	.	.	3	25
<i>Traunsteinera globosa</i>	E1	.	.	+	.	+	+	.	.	.	.	.	.	3	25
<i>Astrantia major</i>	E1	1	1	.	.	.	.	.	.	.	.	.	.	2	17
<i>Agrostis capillaris</i>	E1	+	+	.	.	.	.	.	.	.	.	.	.	2	17
MA <i>Molinio-Arrhenatheretea</i>															
<i>Galium album</i>	E1	.	.	.	+	+	+	1	+	.	+	+	.	7	58
<i>Lotus corniculatus</i> s. lat.	E1	.	+	1	+	.	.	.	.	+	.	+	+	6	50
<i>Dactylis glomerata</i> s. str.	E1	.	.	+	+	.	+	+	1	.	+	.	.	6	50
<i>Lathyrus pratensis</i>	E1	+	.	.	.	.	.	.	.	+	+	1	+	5	42
<i>Leontodon hispidus</i> subsp. <i>hispidus</i>	E1	.	.	+	+	.	.	.	.	.	.	.	.	2	17
<i>Trifolium pratense</i>	E1	.	.	+	.	.	.	+	.	.	.	.	.	2	17
<i>Angelica sylvestris</i>	E1	.	.	.	.	.	.	+	.	+	.	.	.	2	17
<i>Vicia sepium</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	1	8
<i>Achillea roseoalba</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	Pr.	Fr.	
	<i>Veronica chamaedrys</i>	E1	.	.	.	.	.	.	.	.	.	+	.	1	8
CU	Calluno-Ulicetea															
	<i>Potentilla erecta</i>	E1	+	+	.	.	.	.	.	.	1	1	.	4	33
	<i>Arnica montana</i>	E1	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Carex pilulifera</i>	E1	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Luzula multiflora</i>	E1	.	.	+	.	.	.	.	.	.	.	.	1	8
MuA	Mulgedio-Aconitetea															
	<i>Hypericum maculatum</i>	E1	1	+	+	.	.	+	.	+	+	+	.	7	58	
	<i>Rumex arifolius</i>	E1	1	+	.	.	.	+	+	.	+	+	.	6	50	
	<i>Lathyrus occidentalis</i> var. <i>montanus</i>	E1	+	+	+	.	.	2	+	.	.	.	.	5	42
	<i>Silene vulgaris</i> subsp. <i>antelopum</i>	E1	.	.	+	.	.	1	1	.	1	.	.	5	42	
	<i>Pleurospermum austriacum</i>	E1	.	.	.	+	+	+	.	+	.	.	.	5	42	
	<i>Veratrum album</i> s. lat.	E1	1	1	+	.	+	r	.	.	.	.	.	5	42
	<i>Heracleum sphondylium</i> subsp. <i>montanum</i>	E1	2	.	.	.	.	1	+	+	.	.	.	4	33
	<i>Polygonatum verticillatum</i>	E1	.	1	.	.	+	1	.	3	.	.	.	4	33	
	<i>Thalictrum aquilegifolium</i>	E1	r	.	.	.	.	.	+	+	.	.	.	3	25
	<i>Carduus carduelis</i>	E1	.	.	+	.	.	.	.	+	+	.	.	3	25
	<i>Senecio ovatus</i>	E1	+	.	.	.	.	.	.	+	.	.	.	2	17
	<i>Chaerophyllum villarsii</i>	E1	.	+	.	.	.	1	.	.	.	.	.	2	17
	<i>Silene dioica</i>	E1	.	.	.	.	+	.	+	.	.	.	.	2	17
	<i>Aconitum lycoctonum</i> subsp. <i>ranunculifolium</i>	E1	.	.	.	.	.	+	2	.	.	.	.	2	17
	<i>Crepis pyrenaica</i>	E1	.	.	.	.	.	.	+	+	.	.	.	2	17
	<i>Myrrhis odorata</i>	E1	.	.	.	.	.	.	+	+	.	.	.	2	17
	<i>Poa hybrida</i>	E1	.	.	.	.	.	.	+	1	.	.	.	2	17
	<i>Allium victorialis</i>	E1	.	3	.	.	.	.	.	.	.	.	.	1	8
	<i>Aconitum degenii</i> subsp. <i>paniculatum</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Geum rivale</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Pedicularis hacquetii</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Ranunculus platanifolius</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Eryngium alpinum</i>	E1	.	.	.	.	.	.	.	2	.	.	.	1	8
	<i>Sorbus chamaemespilus</i>	E2	.	.	.	.	.	.	.	1	.	.	.	1	8
	<i>Aconitum angustifolium</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
TR	Thlaspietea rotundifolii															
	<i>Ligusticum seguieri</i>	E1	+	.	+	.	.	1	3	25
	<i>Adenostyles glabra</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Viola pyrenaica</i>	E1	.	.	.	.	.	.	.	1	.	.	.	1	8
AT	Asplenietea trichomanis															
	<i>Primula auricula</i>	E1	.	.	.	.	+	r	.	.	+	.	.	3	25
	<i>Sedum maximum</i>	E1	.	.	.	.	.	.	.	+	.	.	.	1	8
	<i>Dianthus sylvestris</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Saxifraga crustata</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Saxifraga hostii</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Sempervivum tectorum</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Silene hayekiana</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Asplenium ruta-muraria</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Iris pallida</i> subsp. <i>cengialti</i>	E1	.	.	.	.	.	.	.	.	.	.	+	1	8
EP	Erico-Pinetea															
	<i>Chamaecytisus hirsutus</i> subsp. <i>ciliatus</i>	E1	+	+	.	.	.	.	.	.	+	+	+	6	50
	<i>Erica carnea</i>	E1	+	1	.	.	.	.	.	.	+	.	.	3	25
	<i>Genista radiata</i>	E1	.	.	.	.	.	3	+	3	.	.	.	3	25
	<i>Calamagrostis varia</i>	E1	.	.	.	.	1	1	.	.	.	.	.	2	17
	<i>Rubus saxatilis</i>	E1	.	.	.	.	+	.	+	.	.	.	.	2	17
	<i>Polygala chamaebuxus</i>	E1	.	.	.	.	.	.	.	.	.	+	+	2	17
	<i>Carex ornithopoda</i>	E1	.	+	.	.	.	.	.	.	.	.	.	1	8

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	Pr.	Fr.
	<i>Molinia caerulea</i> subsp. <i>arundinacea</i>	E1	.	.	.	.	.	.	.	.	+	.	.	1	8
VP	Vaccinio-Piceetea														
	<i>Aposeris foetida</i>	E1	1	+	1	1	+	.	+	.	+	.	.	7	58
	<i>Calamagrostis arundinacea</i>	E1	.	1	.	2	.	.	.	2	.	.	.	3	25
	<i>Luzula luzuloides</i>	E1	.	1	.	.	.	.	.	+	.	.	.	2	17
	<i>Solidago virgaurea</i>	E1	.	1	.	.	.	.	.	+	.	.	.	2	17
	<i>Picea abies</i>	E2	.	.	.	.	1	.	.	.	+	.	.	2	17
	<i>Vaccinium myrtillus</i>	E1	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Clematis alpina</i>	E1	.	.	.	.	.	.	.	+	.	.	.	1	8
	<i>Rosa pendulina</i>	E2	.	.	.	.	.	.	.	+	.	.	.	1	8
EC	Erythronio-Carpinion														
	<i>Ornithogalum pyrenaicum</i>	E1	1	.	.	.	.	+	.	+	.	.	.	3	25
	<i>Helleborus odoratus</i>	E1	.	.	.	.	.	.	.	.	.	+	+	3	25
	<i>Galanthus nivalis</i>	E1	+	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Primula vulgaris</i>	E1	.	.	.	+	.	.	.	.	.	.	.	1	8
AF	Aremonio-Fagion														
	<i>Knautia drymeia</i>	E1	+	1	1	1	+	r	1	+	+	+	1	11	92
FS	Fagetalia sylvaticae														
	<i>Mercurialis perennis</i>	E1	+	.	+	1	+	1	1	1	+	.	+	9	75
	<i>Lilium martagon</i>	E1	1	+	+	.	+	.	.	.	.	.	.	4	33
	<i>Myosotis sylvatica</i>	E1	.	.	+	.	.	.	+	.	.	.	.	2	17
	<i>Campanula trachelium</i>	E1	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Galium laevigatum</i>	E1	.	.	.	.	.	.	.	+	.	.	.	1	8
	<i>Acer pseudoplatanus</i>	E1	.	.	.	.	.	.	.	+	.	.	.	1	8
	<i>Lonicera alpigena</i>	E2	.	.	.	.	.	.	.	.	+	.	.	1	8
QP	Quercetalia pubescentis														
	<i>Melittis melissophyllum</i>	E1	.	.	.	+	.	1	.	.	1	.	.	3	25
	<i>Primula veris</i> subsp. <i>columnae</i>	E1	.	.	.	+	+	+	.	.	.	.	.	3	25
	<i>Peucedanum schottii</i> var. <i>schottii</i>	E1	.	.	.	.	.	.	.	.	1	+	2	3	25
	<i>Convallaria majalis</i>	E1	.	.	.	+	+	.	.	.	.	.	.	2	17
	<i>Orchis mascula</i> subsp. <i>speciosa</i>	E1	.	.	.	.	+	+	.	.	.	.	.	2	17
	<i>Sorbus aria</i>	E2	.	.	.	.	.	r	.	.	+	.	.	2	17
	<i>Peucedanum schottii</i> var. <i>petraeum</i>	E1	.	.	.	.	.	.	.	.	.	+	.	1	8
	<i>Carex flacca</i>	E1	.	.	.	.	.	.	.	.	.	.	1	1	8
QF	Quercio-Fagetea														
	<i>Cruciata glabra</i>	E1	.	.	.	.	.	.	.	.	1	1	+	3	25
	<i>Veratrum nigrum</i>	E1	.	.	.	.	.	.	.	.	1	1	r	3	25
	<i>Carex digitata</i>	E1	.	.	+	.	.	.	.	+	.	.	.	2	17
	<i>Corylus avellana</i>	E2	.	.	.	.	.	.	.	.	+	.	+	2	17
	<i>Anemone nemorosa</i>	E1	+	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Listera ovata</i>	E1	.	.	.	+	.	.	.	.	.	.	.	1	8
	<i>Dactylorhiza fuchsii</i>	E1	.	.	.	.	+	.	.	.	.	.	.	1	8
RP	Rhamno-Prunetea														
	<i>Rhamnus catharticus</i>	E2a	.	.	.	.	.	.	.	.	.	.	r	1	8
O	Other species														
	<i>Juniperus communis</i>	E2	.	.	.	.	+	.	.	.	.	.	.	1	8
ML	Mosses														
	<i>Tortella tortuosa</i>	E0	.	.	.	.	.	.	.	.	+	+	.	2	17
	<i>Schistidium apocarpum</i>	E0	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Fissidens dubius</i>	E0	.	.	.	.	.	.	.	.	.	+	.	1	8

A Limestone, D Dolomite, R Chert, L Marl, Gr Gravel, Re Rendzina, Li Lithosol

Table 3: *Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*, the Carnic Alps, W Julian Alps, NE Italy.
Tabela 3: *Centaureo julici-Laserpitietum sileris* var. geogr. *Pedicularis elongata*, Karnijske in zahodne Julijske Alpe, severovzhodna Italija.

Number of relevé	1	2	3	4	5	6	7	8
Working number of relevé	LP1	LP2	LP3	LP4	LP5	LP6	LP7	LP8
Altitude in m	1880	1720	1530	1550	1520	1470	1470	1240
Aspect	SW	S	S	S	SSE	S	S	S
Slope in degrees	25	30	20	45	30	25	25	30
Parent material	D	D	D	D	D	D	D	D
Soil	Re	Re	Re	Re	Re	Re	Re	Re
Cover of herb layer in %	100	100	100	100	100	100	100	100
Number of species	85	85	85	85	85	85	85	94
Relevé area	30	30	30	30	30	30	30	30
Date of taking relevé	8. 22. 2003	9. 21. 2003	9. 21. 2003	9. 21. 2003	9. 21. 2003	9. 21. 2003	9. 21. 2003	9. 21. 2003
Locality	M. Chiadin (Sappada)	M. Talm	M. Talm	sentiero Alta Via Val Raccollana	sentiero Alta Via Val Raccollana	sentiero Alta Via Val Raccollana	sentiero Alta Via Val Raccollana	sentiero Alta Via Val Raccollana
Quadrant	9442 1	9442 4	9442 4	9546 4	9546 4	9546 4	9546 4	9546 4

Diagnostic species of the association

										Pr.	Fr.	
TR	<i>Laserpitium siler</i>	E1	3	3	2	4	3	3	4	4	8	100
ES	<i>Carduus crassifolius</i>	E1	1	.	1	1	1	.	1	+	6	75
TR	<i>Laserpitium latifolium</i> (subsp. <i>asperum</i>)	E1	+	.	+	1	1	3	.	.	5	63
CA	<i>Laserpitium peucedanoides</i>	E1	+	+	+	.	.	.	.	.	3	38
ES	<i>Serratula tinctoria</i> (cfr. <i>macrocephala</i>)	E1	.	+	+	.	.	.	+	.	3	38
CA	<i>Gentiana lutea</i> subsp. <i>symphyandra</i>	E1	.	.	.	.	+	.	1	.	2	25
Geographical differential species												
ES	<i>Pedicularis elongata</i> subsp. <i>elongata</i>	E1	+	+	+	.	.	.	.	.	3	38
EP	<i>Knautia ressmannii</i>	E1	.	.	.	.	.	+	.	.	1	13
TR	<i>Euphorbia triflora</i> subsp. <i>kernerii</i>	E1	.	.	.	.	.	.	.	+	1	13
CU	<i>Caricion austroalpinae</i>											
	<i>Festuca calva</i>	E1	.	.	.	+	.	.	1	.	2	25
	<i>Allium ericetorum</i>	E1	.	.	.	.	.	.	+	+	2	25
	<i>Linum julicum</i>	E1	.	.	.	.	.	.	1	.	1	13
ES	<i>Elyno-Seslerietea</i>											
	<i>Betonica alopecurus</i>	E1	2	1	1	1	1	+	1	1	8	100
	<i>Helianthemum nummularium</i> subsp. <i>grandiflorum</i>	E1	+	+	1	+	+	+	+	1	8	100
	<i>Scabiosa lucida</i> s. lat. (cfr. <i>stricta</i>)	E1	1	+	+	+	1	+	1	+	8	100
	<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	2	2	1	1	1	.	.	.	5	63
	<i>Rhinanthus glacialis</i>	E1	.	+	.	+	+	.	+	+	5	63
	<i>Leucanthemum</i> cfr. <i>heterophyllum</i> (? <i>adustum</i>)	E1	.	1	1	.	+	.	.	+	4	50
	<i>Carex sempervirens</i>	E1	1	+	.	.	.	.	1	.	3	38
	<i>Phyteuma orbiculare</i>	E1	+	+	+	.	.	.	.	.	3	38
	<i>Acinos alpinus</i>	E1	.	1	.	+	.	.	.	.	2	25
	<i>Anthyllis vulneraria</i> subsp. <i>alpestris</i>	E1	.	+	+	.	.	.	.	.	2	25
	<i>Thesium alpinum</i>	E1	.	.	.	.	.	+	.	+	2	25
	<i>Ranunculus hybridus</i>	E1	+	.	.	.	.	.	.	.	1	13
	<i>Senecio abrotanifolius</i>	E1	+	.	.	.	.	.	.	.	1	13
	<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	.	+	.	.	.	.	.	.	1	13
	<i>Globularia cordifolia</i>	E1	.	.	+	.	.	.	.	.	1	13

Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
	<i>Helianthemum alpestre</i>	E1	.	.	+	.	.	.	.	1	13
	<i>Campanula thyrsoidea</i> subsp. <i>carniolica</i>	E1	.	.	.	.	+	.	.	1	13
	<i>Galium anisophyllum</i>	E1	.	.	.	.	.	.	+	1	13
	<i>Pulsatilla alpina</i> subsp. <i>australpina</i>	E1	.	.	.	.	.	.	1	1	13
	<i>Senecio doronicum</i>	E1	.	.	.	.	.	.	1	1	13
	<i>Polygonum viviparum</i>	E1	.	.	.	.	.	.	+	1	13
FB	<i>Festuco-Brometea</i>	E1									
	<i>Prunella grandiflora</i>	E1	1	1	1	.	+	+	1	+	7 88
	<i>Carex humilis</i>	E1	.	2	1	1	1	.	1	1	6 75
	<i>Bromus transilvanicus</i>	E1	1	1	+	.	2	.	1	.	5 63
	<i>Bupthalmum salicifolium</i>	E1	+	+	.	.	+	+	.	.	4 50
	<i>Koeleria pyramidata</i> s. lat.	E1	1	1	.	.	1	.	.	1	4 50
	<i>Gymnadenia conopsea</i>	E1	1	.	.	.	.	.	+	.	2 25
	<i>Festuca rupicola</i>	E1	.	1	.	.	.	.	.	1	2 25
	<i>Cirsium erisithales</i>	E1	.	.	1	1	1	+	.	.	4 50
	<i>Centaurea bracteata</i>	E1	.	.	.	1	1	.	+	+	4 50
	<i>Phleum phleoides</i>	E1	.	.	.	1	2	1	.	.	3 38
	<i>Asperula</i> cfr. <i>cynanchica</i>	E1	.	.	.	+	+	.	.	.	2 25
	<i>Carex caryophyllea</i>	E1	.	.	.	+	.	.	1	.	2 25
	<i>Brachypodium rupestre</i>	E1	.	.	.	.	.	.	.	2	2 25
	<i>Galium verum</i>	E1	.	.	.	.	+	.	.	+	2 25
	<i>Stachys labiosa</i>	E1	.	.	.	.	+	.	.	.	1 13
	<i>Briza media</i>	E1	.	.	.	.	.	+	.	.	1 13
	<i>Galium lucidum</i>	E1	.	.	.	.	.	+	.	.	1 13
	<i>Bromus erectus</i> s. lat.	E1	.	.	.	.	.	.	.	1	1 13
	<i>Bupleurum ranunculoides</i> subsp. <i>caricinum</i>	E1	.	.	.	.	.	.	.	1	1 13
	<i>Linum viscosum</i>	E1	.	.	.	.	.	.	.	1	1 13
	<i>Peucedanum oreoselinum</i>	E1	.	.	.	.	.	.	.	1	1 13
	<i>Centaurea triumfetti</i> subsp. <i>aligera</i> (= <i>C. axilaris</i>)	E1	.	.	.	.	.	.	.	+	1 13
	<i>Allium carinatum</i>	E1	.	.	.	.	.	.	.	+	1 13
	<i>Asperula purpurea</i>	E1	.	.	.	.	.	.	.	+	1 13
	<i>Carlina acaulis</i>	E1	.	.	.	.	.	.	.	+	1 13
	<i>Teucrium chamaedrys</i>	E1	.	.	.	.	.	.	.	+	1 13
TG	<i>Trifolio-Geranietea</i>										
	<i>Valeriana collina</i>	E1	.	.	.	+	+	1	+	+	5 63
	<i>Polygonatum odoratum</i>	E1	.	.	.	.	2	+	+	1	4 50
	<i>Thalictrum minus</i>	E1	.	.	.	+	.	.	+	+	3 38
	<i>Silene nutans</i> s. lat.	E1	+	.	.	.	.	.	.	+	2 25
	<i>Vincetoxicum hircundinaria</i>	E1	.	.	+	.	.	.	.	+	2 25
	<i>Clinopodium vulgare</i>	E1	.	.	.	.	.	1	+	.	2 25
	<i>Thesium bavarum</i>	E1	.	.	+	.	.	.	.	.	1 13
	<i>Viola hirta</i>	E1	.	.	.	.	+	.	.	.	1 13
	<i>Digitalis grandiflora</i>	E1	.	.	.	.	.	1	.	.	1 13
	<i>Origanum vulgare</i>	E1	.	.	.	.	.	+	.	.	1 13
PaT	<i>Poo alpinae-Trisetalia</i>										
	<i>Ranunculus nemorosus</i>	E1	.	.	.	1	.	1	.	.	2 25
	<i>Festuca nigrescens</i>	E1	1	.	.	.	.	.	.	.	1 13
MA	<i>Molinio-Arrhenatheretea</i>										
	<i>Lotus corniculatus</i>	E1	.	.	.	.	.	+	+	+	3 38
	<i>Lathyrus pratensis</i>	E1	.	.	.	.	.	+	+	.	2 25
	<i>Trifolium pratense</i>	E1	.	.	.	.	.	+	+	.	2 25
	<i>Vicia cracca</i>	E1	.	.	+	.	.	.	.	.	1 13
	<i>Orobanche minor</i>	E1	.	.	.	.	+	.	.	.	1 13
	<i>Achillea millefolium</i>	E1	.	.	.	.	.	+	.	.	1 13
	<i>Pimpinella major</i>	E1	.	.	.	.	.	+	.	.	1 13

Number of relevé		1	2	3	4	5	6	7	8	Pr.	Fr.
	<i>Veronica chamaedrys</i>	E1	.	.	.	.	+	.	.	1	13
CU	Calluno-Ulicetea										
	<i>Phyteuma zahlbruckneri</i>	E1	.	.	.	.	1	+	.	2	25
	<i>Potentilla erecta</i>	E1	.	.	+	.	.	.	.	1	13
MuA	Mulgedio-Aconitetea										
	<i>Silene vulgaris</i> subsp. <i>antelopum</i>	E1	.	+	+	+	+	+	.	6	75
	<i>Heraclium sphondilium</i> subsp. <i>elegans</i>	E1	.	.	.	1	.	1	+	3	38
	<i>Geranium sylvaticum</i>	E1	.	.	.	.	1	1	.	2	25
	<i>Hypericum maculatum</i>	E1	.	.	.	.	.	+	.	1	13
	<i>Rumex alpestris</i>	E1	.	.	.	.	.	+	.	1	13
	<i>Thalictrum aquilegifolium</i>	E1	.	.	.	.	.	+	.	1	13
	<i>Lathyrus laevigatus</i>	E1	.	.	.	.	.	.	1	1	13
TR	Thlaspietea rotundifolii										
	<i>Biscutella laevigata</i>	E1	.	+	.	.	.	.	+	2	25
AT	Asplenietea trichomanis										
	<i>Campanula spicata</i>	E1	.	+	.	.	.	.	.	1	13
	<i>Saxifraga hostii</i>	E1	.	.	.	+	.	.	.	1	13
EP	Erico-Pinetea										
	<i>Calamagrostis varia</i>	E1	2	2	2	1	2	.	2	7	88
	<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	+	.	.	1	1	1	+	6	75
	<i>Erica carnea</i>	E1	.	+	1	+	.	.	1	5	63
	<i>Genista radiata</i>	E1	.	.	.	2	2	1	2	5	63
	<i>Molinia caerulea</i> subsp. <i>arundinacea</i>	E1	.	2	2	.	.	.	1	4	50
	<i>Chamaecytisus purpureus</i>	E1	.	.	1	.	.	.	1	3	38
	<i>Daphne cneorum</i>	E1	.	1	.	.	.	.	+	2	25
	<i>Arctostaphylos uva-ursi</i>	E1	.	.	.	.	+	.	.	1	13
	<i>Rubus saxatilis</i>	E1	.	.	.	.	+	.	.	1	13
	<i>Polygala chamaebuxus</i>	E1	.	.	.	.	.	.	.	1	13
VP	Vaccinio-Piceetea										
	<i>Larix decidua</i>	E1	.	.	.	.	+	.	.	1	13
	<i>Rosa pendulina</i>	E1	.	.	.	.	.	+	.	1	13
AF	Aremonio-Fagion										
	<i>Cyclamen purpurascens</i>	E1	.	.	.	+	.	.	.	1	13
	<i>Anemone trifolia</i>	E1	.	.	.	.	.	.	+	1	13
FS	Fagetalia sylvaticae										
	<i>Mercurialis perennis</i>	E1	.	.	.	+	+	.	+	4	50
	<i>Luzula nivea</i>	E1	.	.	.	.	+	+	.	2	25
	<i>Galium laevigatum</i>	E1	.	.	.	.	.	+	.	1	13
	<i>Poa nemoralis</i>	E1	.	.	.	.	.	+	.	1	13
QP	Quercetalia pubescentis										
	<i>Carex flacca</i>	E1	.	1	+	.	.	.	+	3	38
	<i>Convallaria majalis</i>	E1	.	.	.	.	.	.	.	1	13
QF	Quercio-Fagetea										
	<i>Carex digitata</i>	E1	.	.	.	.	.	.	+	1	13
O	Other species										
	<i>Fragaria vesca</i>	E1	.	.	.	.	.	1	.	1	13

D Dolomite

Re Rendzina

Table 4: *Laserpitio sileri-Grafietum golakae* Poldini ass. nov., the Julian Prealps, NE Italy.

Tabela 4: *Laserpitio sileri-Grafietum golakae* Poldini ass. nov., Julijske Predalpe, severovzhodna Italija.

Number of relevé	1	2	3	4	5	6	7	8	9	10	11	12	13			
Working number of relevé	215890	544	545	546	547	548	549	550	551	569	570	571	572			
Altitude in m	1450	1580	1040	1240	1100	1340	1360	886	1050	1410	1600	1300	1121			
Aspect	SEE	S	0	0	S	N	N	0	SE	SE	SE	S	S			
Slope in degrees	5	20	0	0	30-35	15	15	0	10	10	5	30	30			
Parent material	A	A	A	A	A	A	A	A	A	A	A	A	A			
Soil	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re			
Cover of herb layer in %	E1	100	100	100	100	100	100	100	100	100	100	100	100			
Number of species	34	22	15	29	48	39	27	27	27	19	27	14	17			
Relevé area	m ²	30	30	30	30	30	30	30	30	30	30	30	30			
Date of taking relevé	6/28/2007	8/20/2000	7/23/2001	8/2/2000	7/23/2000	8/2/2000	8/2/2000	7/23/2000	7/23/2000	8/6/2005	8/6/2005	2004	2004			
Quadrant	9747/3	9746/1	9841/2	9745/1	9645/4	9745/1	9745/1	9645/4	9645/4	9747/3	9747/3	9645/3	9645/4			
Author of the relevé	Dakskobler I.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L.	Poldini L., G. Gobbo	Poldini L., G. Gobbo			
Diagnostic species of the association													Pr.	Fr.		
MuA <i>Grafia golaka</i>	E1	4	3	4	4	1	4	3	2	1	4	4	2	3	13	100
TG <i>Laserpitium siler</i>	E1	.	3	.	.	4	.	.	4	3	.	.	4	4	6	46
MuA <i>Molopospermum peloponnesiacum</i> subsp. <i>bauhinii</i>	E1	r	.	.	1	.	.	.	1	.	+	.	.	.	4	31
CA <i>Laserpitium peucedanoides</i>	E1	.	.	.	.	+	+	1	.	.	.	.	.	.	3	23
MuA <i>Mulgedio-Aconitetea</i>																
<i>Veratrum album</i> subsp. <i>lobelianum</i>	E1	1	.	.	+	+	+	1	.	.	1	1	.	+	8	62
<i>Aconitum lycoctonum</i> subsp. <i>ranunculifolium</i>	E1	+	.	.	1	1	+	.	.	1	.	+	.	2	7	54
<i>Hypericum maculatum</i>	E1	1	.	.	.	.	.	.	.	.	+	.	+	.	3	23
<i>Heracleum sphondylium</i> subsp. <i>montanum</i>	E1	r	.	.	.	+	.	.	.	.	.	.	.	+	3	23
<i>Polygonatum verticillatum</i>	E1	.	.	.	1	.	1	1	.	.	.	.	.	.	3	23
<i>Aconitum tauricum</i> (inc. <i>A. angustifolium</i>)	E1	r	.	.	.	.	.	.	.	.	.	+	.	.	2	15
<i>Senecio ovatus</i>	E1	.	.	.	.	.	.	.	.	.	.	+	1	.	2	15
<i>Alchemilla xanthochlora</i>	E1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Geum rivale</i>	E1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Rumex arifolius</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Rumex alpinus</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Pleurospermum austriacum</i>	E1	.	.	.	1	.	.	.	.	.	.	.	.	.	1	8
<i>Ranunculus platanifolius</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	1	8
<i>Salix glabra</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	.	1	8
<i>Stemmacantha rhapontica</i> subsp. <i>rhapontica</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	1	8
<i>Salix appendiculata</i>	E2	.	.	.	.	.	.	+	.	.	.	.	.	.	1	8
<i>Dactylis glomerata</i> subsp. <i>slovenica</i>	E1	.	.	.	.	.	.	.	.	1	.	.	.	.	1	8
TG <i>Trifolio-Geranietea</i>																
<i>Vincetoxicum hirundinaria</i>	E1	.	.	+	+	1	.	.	1	1	.	.	+	1	7	54
<i>Thalictrum minus</i>	E1	.	.	.	+	.	+	.	+	1	.	+	.	.	5	38
<i>Anthericum ramosum</i>	E1	.	.	.	.	1	.	.	+	1	.	.	.	1	4	31
<i>Libanotis sibirica</i> subsp. <i>montana</i>	E1	.	.	.	.	+	1	1	.	+	.	.	.	.	4	31
<i>Polygonatum odoratum</i>	E1	.	.	.	.	1	.	.	+	1	.	.	.	.	3	23

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	Pr.	Fr.
<i>Achillea distans</i>	E1	2	.	.	.	.	.	.	.	.	.	+	.	.	2	15
<i>Iris graminea</i>	E1	.	1	.	.	+	.	.	.	.	.	.	.	.	2	15
<i>Trifolium rubens</i>	E1	.	.	.	.	1	.	.	.	+	.	.	.	.	2	15
<i>Verbascum lanatum</i>	E1	r	.	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Thesium bavarum</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	1	8
<i>Trifolium medium</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	.	1	8
<i>Clinopodium vulgare</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Inula spiraeifolia</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Silene nutans</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Hypericum perforatum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	1	8
<i>Petasites paradoxus</i>	E1	.	.	.	.	.	.	.	1	.	.	.	.	.	1	8
<i>Laserpitium latifolium</i>	E1	.	.	.	.	.	.	.	2	.	.	.	.	.	1	8
<i>Valeriana collina (V. wallrothii)</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	1	8
<i>Digitalis grandiflora</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	1	8
<i>Vicia sylvatica</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	.	1	8
<i>Libanotis daucifolia</i>	E1	.	.	.	.	.	.	.	.	.	.	.	.	+	1	8
FB <i>Festuco-Brometea</i>																
<i>Buphthalmum salicifolium</i>	E1	.	+	.	.	+	+	1	+	.	.	1	.	+	7	54
<i>Brachypodium rupestre s. lat.</i>	E1	.	.	.	1	2	1	1	.	1	2	.	.	.	6	46
<i>Cirsium erisithales</i>	E1	.	.	.	.	.	1	1	1	.	1	1	1	.	6	46
<i>Scabiosa columbaria</i>	E1	.	+	.	.	+	1	1	+	.	.	.	.	.	5	38
<i>Dianthus monspessulanus</i>	E1	.	+	.	.	1	.	.	.	+	.	.	.	1	4	31
<i>Briza media</i>	E1	1	.	.	.	+	.	.	.	.	+	.	.	.	3	23
<i>Carlina acaulis subsp. simplex</i>	E1	+	.	.	.	.	+	1	.	.	.	.	.	.	3	23
<i>Centaurea triumfettii</i>	E1	.	.	.	.	+	+	.	.	.	.	.	.	+	3	23
<i>Galium verum</i>	E1	.	.	.	.	+	.	+	.	1	.	.	.	.	3	23
<i>Peucedanum oreoselinum</i>	E1	.	.	.	.	1	+	.	.	1	.	.	.	.	3	23
<i>Bromopsis transsilvanica</i>	E1	.	2	.	.	.	1	.	.	.	.	.	.	.	2	15
<i>Trifolium montanum</i>	E1	.	.	.	+	.	.	.	.	+	.	.	.	.	2	15
<i>Campanula glomerata</i>	E1	.	.	.	.	+	+	.	.	.	.	.	.	.	2	15
<i>Allium carinatum subsp. carinatum</i>	E1	.	.	.	.	+	.	.	.	+	.	.	.	.	2	15
<i>Asphodelus albus</i>	E1	1	.	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Gymnadenia conopsea</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Ranunculus polyanthemophyllus</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	.	1	8
<i>Bromopsis erecta</i>	E1	.	.	.	.	1	.	.	.	.	.	.	.	.	1	8
<i>Helictotrichon praeustum</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Stachys labiosa</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Thymus pulegioides</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Veronica teucrium</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	.	1	8
<i>Euphorbia cyparissias</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	.	1	8
<i>Centaurea scabiosa subsp. fritschii</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	.	1	8
<i>Cirsium pannonicum</i>	E1	.	.	.	.	.	.	.	.	1	.	.	.	.	1	8
<i>Cirsium x linkianum</i>	E1	.	.	.	.	.	.	.	.	+	.	.	.	.	1	8
<i>Campanula rotundifolia</i>	E1	.	.	.	.	.	.	.	.	.	.	4	.	.	1	8
<i>Centaurea bracteata</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	.	1	8
CA <i>Caricion austroalpinae</i>																
<i>Scorzonera rosea</i>	E1	+	.	.	.	.	.	.	.	.	+	.	.	.	2	15
<i>Koeleria eriostachya</i>	E1	.	1	.	.	.	.	.	.	.	.	1	.	.	2	15
<i>Centaurea haynaldii subsp. julica</i>	E1	.	.	.	.	.	+	1	.	.	.	.	.	.	2	15
<i>Festuca calva</i>	E1	.	.	.	.	.	.	.	.	.	.	1	+	.	2	15
ES <i>Elyno-Seslerietea</i>																
<i>Rhinanthus aristatus</i>	E1	+	1	.	.	.	.	.	.	.	.	1	+	.	4	31
<i>Betonica alopecurus</i>	E1	.	.	.	1	+	1	.	1	.	.	.	.	.	4	31
<i>Leucanthemum heterophyllum</i>	E1	.	+	.	.	.	.	+	.	.	.	.	.	.	2	15
<i>Sesleria caerulea subsp. calcaria</i>	E1	.	+	.	.	1	.	.	.	.	.	.	.	.	2	15

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	Pr.	Fr.
	<i>Galium anisophyllum</i>	E1	.	+	.	.	.	.	.	.	.	+	.	.	2	15
	<i>Carduus crassifolius</i> s. lat.	E1	.	.	.	1	.	.	.	.	.	.	.	+	2	15
	<i>Phleum hirsutum</i>	E1	.	.	.	1	.	.	.	+	.	.	.	.	2	15
	<i>Helianthemum nummularium</i> subsp. <i>grandiflorum</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Pimpinella alpina</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
	<i>Carduus defloratus</i>	E1	.	.	.	.	.	.	+	.	.	.	.	.	1	8
	<i>Leucanthemum adustum</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
	<i>Carex sempervirens</i>	E1	.	.	.	.	.	.	.	.	.	.	.	+	1	8
	<i>Scabiosa lucida</i> subsp. <i>lucida</i>	E1	.	.	.	.	.	.	.	.	.	.	.	1	1	8
PaT	<i>Poo alpinae-Trisetalia</i>															
	<i>Agrostis capillaris</i>	E1	+	.	.	.	.	.	.	+	1	+	+	.	5	38
	<i>Trollius europaeus</i>	E1	+	.	.	1	.	1	1	.	.	.	+	.	5	38
	<i>Campanula scheuchzeri</i>	E1	.	+	+	.	.	.	.	+	+	.	.	+	5	38
	<i>Festuca nigrescens</i>	E1	1	.	.	.	.	.	.	.	.	1	.	.	2	15
	<i>Ranunculus nemorosus</i>	E1	+	.	.	.	.	.	.	+	.	.	.	.	2	15
	<i>Traunsteinera globosa</i>	E1	.	+	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Astrantia major</i> subsp. <i>carinthiaca</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	1	8
	<i>Cerastium fontanum</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
MA	<i>Molinio-Arrhenetheretea</i>															
	<i>Angelica sylvestris</i>	E1	1	.	.	2	.	.	1	.	.	+	.	.	4	31
	<i>Dactylis glomerata</i> s.str.	E1	1	+	.	.	+	.	.	.	.	.	.	.	3	23
	<i>Lathyrus pratensis</i>	E1	.	.	.	.	+	+	+	.	.	.	.	.	3	23
	<i>Galium album</i>	E1	.	.	.	.	+	.	.	.	.	+	.	.	2	15
	<i>Trifolium pratense</i>	E1	.	.	.	.	.	+	.	.	.	+	.	.	2	15
	<i>Deschampsia cespitosa</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Rumex acetosa</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Stellaria graminea</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Vicia cracca</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	1	8
	<i>Leontodon hispidus</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
	<i>Tragopogon orientalis</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Festuca rubra</i>	E1	.	.	.	.	.	.	.	.	1	.	.	.	1	8
CU	<i>Calluno-Ulicetea</i>															
	<i>Potentilla erecta</i>	E1	+	+	.	.	.	.	.	.	.	.	.	.	2	15
	<i>Phyteuma zahlbruckneri</i>	E1	+	.	.	.	.	.	.	.	.	.	.	.	1	8
	<i>Danthonia decumbens</i>	E1	.	.	.	.	.	.	.	.	.	+	.	.	1	8
TR	<i>Thlaspietea rotundifolii</i>															
	<i>Adenostyles glabra</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
	<i>Astrantia carniolica</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
EP	<i>Erico-Pinetea</i>															
	<i>Rubus saxatilis</i>	E1	.	.	+	+	.	+	+	+	.	.	.	.	5	38
	<i>Calamagrostis varia</i>	E1	.	.	.	1	.	1	+	+	1	.	.	.	5	38
	<i>Chamaecytisus purpureus</i>	E1	.	.	.	.	+	.	.	+	.	.	.	.	2	15
	<i>Molinia caerulea</i> subsp. <i>arundinacea</i>	E1	.	.	.	.	.	.	.	1	1	.	.	.	2	15
	<i>Erica carnea</i>	E1	.	.	1	.	.	.	.	.	.	.	.	.	1	8
	<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	.	.	.	.	+	.	.	.	.	.	.	.	1	8
	<i>Genista radiata</i>	E1	.	.	.	.	.	.	.	1	.	.	.	.	1	8
	<i>Carex alba</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	1	8
VP	<i>Vaccinio-Piceetea</i>															
	<i>Calamagrostis arundinacea</i>	E1	+	.	.	1	.	.	.	.	1	2	.	.	4	31
	<i>Gentiana asclepiadea</i>	E1	+	.	.	+	.	+	+	.	.	.	.	.	4	31
	<i>Luzula luzuloides</i>	E1	+	.	.	+	.	.	.	.	1	.	.	.	3	23
	<i>Rosa pendulina</i>	E1	.	.	.	+	.	+	.	.	.	.	.	.	2	15
AF	<i>Aremonio-Fagion</i>															
	<i>Knautia drymeia</i>	E1	1	.	1	1	+	1	1	.	.	.	+	1	8	62

Number of relevé		1	2	3	4	5	6	7	8	9	10	11	12	13	Pr.	Fr.
FS	Fagetalia sylvaticae															
	<i>Lilium martagon</i>	E1	+	.	.	+	+	+	.	.	.	.	.	+	5	38
	<i>Mercurialis perennis</i>	E1	.	.	+	.	+	1	+	.	.	.	.	.	4	31
	<i>Heracleum sphondylium</i> subsp. <i>sphondylium</i>	E1	.	.	.	.	.	.	.	.	1	1	+	.	3	23
	<i>Luzula nivea</i>	E1	.	+	.	+	.	.	.	.	.	.	.	.	2	15
	<i>Lathyrus vernus</i>	E1	.	.	+	.	.	.	.	+	.	.	.	.	2	15
	<i>Laburnum alpinum</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Acer pseudoplatanus</i>	E1	.	.	+	.	.	.	.	.	.	.	.	.	1	8
	<i>Melica nutans</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	1	8
	<i>Symphytum tuberosum</i> subsp. <i>angustifolium</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	1	8
	<i>Galeobdolon flavidum</i>	E1	.	.	.	.	.	+	.	.	.	.	.	.	1	8
	<i>Fraxinus excelsior</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	1	8
	<i>Daphne mezereum</i>	E1	.	.	.	.	.	.	.	.	.	.	+	.	1	8
QP	Quercetalia pubescentis															
	<i>Convallaria majalis</i>	E1	.	.	+	.	+	.	1	.	1	.	.	.	4	31
	<i>Carex flacca</i>	E1	.	.	.	+	.	+	.	.	.	.	.	.	2	15
	<i>Peucedanum schottii</i> var. <i>schottii</i>	E1	.	.	.	.	+	+	.	.	.	.	.	.	2	15
QF	Quercu-Fagetea															
	<i>Serratula tinctoria</i> subsp. <i>tinctoria</i>	E1	.	.	+	.	+	.	+	+	.	.	.	1	5	38
	<i>Dactylorhiza fuchsii</i>	E1	.	.	.	+	.	.	.	+	.	.	.	.	2	15
	<i>Helleborus odorus</i>	E1	.	.	.	.	+	+	.	.	.	.	.	.	2	15
	<i>Cruciata glabra</i>	E1	.	.	.	.	.	+	+	.	.	.	.	.	2	15
	<i>Festuca gigantea</i>	E1	.	.	.	+	.	.	.	.	.	.	.	.	1	8
O	Other species															
	<i>Rubus idaeus</i>	E2	2	1	+	.	+	.	.	.	2	+	1	.	7	54
	<i>Potentilla recta</i>	E1	.	.	.	.	.	.	1	.	1	.	.	.	2	15
	<i>Salix eleagnos</i>	E1	.	.	.	.	.	.	.	+	.	.	.	.	1	8

A Limestone
Re Rendzina

Locality:

- 1 – Matajur
- 2 – Punta Lausciovizza – Lanževica
- 3 – M. Fara (Montereale Valcellina)
- 4 – M. Cuarnan – Mali Karman
- 5 – M. Cadin
- 6 – M. Cuarnan – Mali Karman
- 7 – M. Cuarnan – Mali Karman
- 8 – M. Cadin – Plan di Tapou – Tam za Topolom
- 9 – M. Cadin
- 10 – Matajur
- 11 – Matajur
- 12 – Cima di Campo
- 13 – M. Cadin

Table 5: Synoptyc table of the tall herb and fringe communities with the dominant *Laserpitium siler* or *Grafia golaka* in NE Italy and Slovenia.**Tabela 5:** Sintezna tabela združb visokih steblik in gozdnih robov z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v severovzhodni Italiji in Sloveniji.

Successive number (Zaporedna številka)		1	2	3	4	5	6	7
Number of relevés (Število popisov)		31	12	26	8	13	10	10
Sign for the syntaxa (Oznaka sintaksonov)		CJLS1	CJLS2	CJLSaa	CJLSLP	GgLs	ShGg	Ls
CA <i>Caricion austroalpinae</i>								
<i>Centaurea haynaldii</i> subsp. <i>julica</i>	E1	84	100	85	.	15	.	.
<i>Gentiana lutea</i> subsp. <i>symphyandra</i>	E1	55	33	88	25	.	.	.
<i>Festuca calva</i>	E1	52	50	15	25	15	.	.
<i>Laserpitium peucedanoides</i>	E1	32	50	38	38	23	.	.
<i>Scorzonera rosea</i>	E1	32	50	23	.	15	.	.
<i>Allium ericetorum</i>	E1	29	33	62	25	.	20	.
<i>Asperula aristata</i>	E1	23	33	.	.	.	.	.
<i>Linum julicum</i>	E1	16	17	4	13	.	.	.
<i>Pedicularis elongata</i> subsp. <i>julica</i>	E1	10	8	.	.	.	.	.
<i>Heracleum austriacum</i> subsp. <i>siifolium</i>	E1	3	8	.	.	.	.	.
<i>Gentiana lutea</i> subsp. <i>vardjanii</i>	E1	3	.	.	.	.	.	.
ES <i>Elyno-Seslerietea</i>								
<i>Betonica alopecuroides</i>	E1	97	100	96	100	31	100	.
<i>Sesleria caerulea</i> subsp. <i>calcaria</i>	E1	94	58	81	63	15	80	.
<i>Carduus crassifolius</i>	E1	90	58	42	75	15	70	.
<i>Helianthemum nummularium</i> subsp. <i>grandiflorum</i>	E1	87	75	81	100	8	.	.
<i>Scabiosa lucida</i> subsp. <i>stricta</i> (inc. subsp. <i>lucida</i>)	E1	77	75	27	100	8	.	.
<i>Serratula tinctoria</i> subsp. <i>macrocephala</i>	E1	74	83	8	38	.	.	.
<i>Carex sempervirens</i>	E1	65	33	.	38	8	.	.
<i>Phyteuma orbiculare</i>	E1	65	75	62	38	.	90	60
<i>Campanula witasekiana</i>	E1	61	67	46	.	.	.	.
<i>Phleum hirsutum</i>	E1	45	67	19	.	15	.	.
<i>Pulsatilla alpina</i> subsp. <i>austroalpina</i>	E1	42	42	.	13	.	.	.
<i>Leucanthemum adustum</i> (inc. <i>L. heterophyllum</i>)	E1	39	50	.	50	23	.	.
<i>Thymus praecox</i> subsp. <i>polytrichus</i>	E1	39	17	77	13	.	.	.
<i>Cerastium strictum</i>	E1	32	8	8	.	.	.	.
<i>Acinos alpinus</i>	E1	29	17	.	25	.	.	.
<i>Anthyllis vulneraria</i> subsp. <i>alpestris</i>	E1	29	33	4	25	.	.	.
<i>Galium anisophyllum</i>	E1	29	33	.	13	15	.	.
<i>Ranunculus montanus</i>	E1	29	8	.	.	.	.	.
<i>Rhinanthus aristatus</i>	E1	26	25	4	63	31	.	30
<i>Globularia cordifolia</i>	E1	19	.	.	13	.	.	.
<i>Astrantia bavarica</i>	E1	16	8	.	.	.	.	.
<i>Hieracium villosum</i>	E1	16	33	.	.	.	.	.
<i>Polygonum viviparum</i>	E1	13	25	.	13	.	.	.
<i>Thesium alpinum</i>	E1	13	8	4	25	.	.	.
<i>Pimpinella alpina</i>	E1	13	8	.	.	8	.	.
<i>Potentilla crantzii</i>	E1	13	.	.	.	.	.	.
<i>Gentiana verna</i>	E1	13	.	.	.	.	.	.
<i>Campanula thyrsoidea</i> (inc. subsp. <i>carniolica</i>)	E1	10	33	.	13	.	.	.
<i>Bartsia alpina</i>	E1	6	17	.	.	.	.	.
<i>Polygala alpestris</i>	E1	6	.	4	.	.	.	.
<i>Achillea clavinae</i>	E1	6	.	.	.	.	.	.

Successive number		1	2	3	4	5	6	7
<i>Crepis alpestris</i>	E1	6	.	.	.	.	.	.
<i>Gentianella anisodonta</i>	E1	6	.	.	.	.	.	.
<i>Orobanche reticulata</i>	E1	6	.	.	.	.	.	.
<i>Astragalus penduliflorus</i>	E1	3	33	23	.	.	.	.
<i>Carex ferruginea</i>	E1	3	33	.	.	.	.	.
<i>Anemone narcissiflora</i>	E1	3	25	.	.	.	.	.
<i>Senecio abrotanifolius</i>	E1	3	.	.	13	.	.	.
<i>Alchemilla fissa</i>	E1	3	.	.	.	.	.	.
<i>Androsace villosa</i>	E1	3	.	.	.	.	.	.
<i>Aster alpinus</i>	E1	3	.	.	.	.	.	.
<i>Carex mucronata</i>	E1	3	.	.	.	.	.	.
<i>Gentiana clusii</i>	E1	3	.	.	.	.	.	.
<i>Globularia nudicaulis</i>	E1	3	.	.	.	.	.	.
<i>Hieracium pilosum</i>	E1	3	.	.	.	.	.	.
<i>Myosotis alpestris</i>	E1	3	.	.	.	.	.	.
<i>Oxytropis neglecta</i>	E1	3	.	.	.	.	.	.
<i>Thesium pyrenaicum</i>	E1	3	.	.	.	.	.	.
<i>Carduus defloratus</i>	E1	.	8	.	.	8	.	.
<i>Crepis bocconi</i>	E1	.	8	.	.	.	.	.
<i>Pedicularis elongata</i>	E1	.	.	.	38	.	.	.
<i>Helianthemum alpestre</i>	E1	.	.	.	13	.	.	.
<i>Ranunculus hybridus</i>	E1	.	.	.	13	.	.	.
<i>Senecio doronicum</i>	E1	.	.	.	13	.	.	.
<i>Sesleria juncifolia</i> subsp. <i>kalnikensis</i>	E1	.	.	.	.	.	.	10
FB <i>Festuco-Brometea</i>								
<i>Bupthalmum salicifolium</i>	E1	94	83	62	50	54	50	90
<i>Bromopsis transsilvanica</i>	E1	90	83	96	63	15	.	.
<i>Carex humilis</i>	E1	90	42	96	75	.	10	10
<i>Koeleria pyramidata</i> s. lat. (inc. <i>K. eryostachia</i>)	E1	77	58	42	50	15	50	60
<i>Gymnadenia conopsea</i>	E1	74	50	19	25	8	10	60
<i>Prunella grandiflora</i>	E1	74	50	50	88	.	.	.
<i>Cirsium erisithales</i>	E1	71	75	38	50	46	50	30
<i>Carlina acaulis</i> s. lat.	E1	55	83	77	13	23	10	60
<i>Linum viscosum</i>	E1	55	33	96	13	.	.	.
<i>Dianthus monspessulanus</i>	E1	52	50	38	.	31	10	.
<i>Centaurea triumfettii</i>	E1	48	50	19	13	23	90	20
<i>Campanula glomerata</i>	E1	35	50	69	.	15	50	.
<i>Thlaspi praecox</i>	E1	32	8	.	.	.	.	.
<i>Stachys recta</i> agg. (inc. <i>S. labiosa</i>)	E1	29	8	19	13	8	50	30
<i>Hippocrepis comosa</i>	E1	23	8	4	.	.	10	30
<i>Allium senescens</i>	E1	19	.	.	.	.	.	.
<i>Briza media</i>	E1	19	42	27	13	23	40	40
<i>Galium lucidum</i>	E1	19	17	4	13	.	100	50
<i>Arabis hirsuta</i>	E1	13	.	.	.	.	10	.
<i>Allium carinatum</i> subsp. <i>pulchellum</i>	E1	10	8	62	.	.	.	.
<i>Teucrium chamaedrys</i>	E1	10	8	31	13	.	30	20
<i>Cuscuta epithymum</i>	E1	6	.	.	.	.	.	.
<i>Euphorbia cyparissias</i>	E1	6	8	58	.	8	40	10
<i>Helictotrichon praeustum</i>	E1	6	25	.	.	8	.	.
<i>Orobanche gracilis</i>	E1	6	.	.	.	.	.	.
<i>Brachypodium rupestre</i>	E1	3	50	96	25	46	90	10

Successive number		1	2	3	4	5	6	7
<i>Trifolium montanum</i>	E1	3	25	42	.	15	.	60
<i>Plantago media</i>	E1	3	17	12	.	.	.	50
<i>Peucedanum oreoselinum</i>	E1	3	17	.	13	23	20	50
<i>Thymus pulegioides</i>	E1	3	8	.	.	8	.	.
<i>Sanguisorba minor</i>	E1	3	8	.	.	.	.	10
<i>Dactylorhiza sambucina</i>	E1	3	.	4	.	.	.	.
<i>Salvia pratensis</i>	E1	3	.	.	.	.	30	50
<i>Pimpinella saxifraga</i>	E1	3	.	.	.	.	30	20
<i>Polygala comosa</i>	E1	3	.	.	.	.	.	80
<i>Teucrium montanum</i>	E1	3	.	.	.	.	.	.
<i>Carlina vulgaris</i>	E1	3	.	.	.	.	.	.
<i>Cirsium pannonicum</i>	E1	.	25	27	.	8	.	80
<i>Inula hirta</i>	E1	.	25	58	.	.	.	.
<i>Galium verum</i>	E1	.	25	.	25	23	20	50
<i>Allium carinatum</i> subsp. <i>carinatum</i>	E1	.	25	.	13	15	10	.
<i>Iris sibirica</i> subsp. <i>erirrhiza</i>	E1	.	25	.	.	.	.	.
<i>Helianthemum nummularium</i> subsp. <i>obscurum</i>	E1	.	17	.	.	.	10	90
<i>Veronica teucrium</i>	E1	.	17	.	.	8	.	.
<i>Hypochoeris maculata</i>	E1	.	8	35	.	.	.	10
<i>Cirsium x linkianum</i>	E1	.	8	23	.	8	.	.
<i>Silene vulgaris</i> subsp. <i>vulgaris</i>	E1	.	8	4	.	.	60	10
<i>Asperula cynanchica</i>	E1	.	8	.	25	.	60	70
<i>Veronica barrelieri</i> (<i>Pseudolysimachion barrelieri</i>)	E1	.	8	.	.	.	.	.
<i>Asphodelus albus</i>	E1	.	.	100	.	8	.	.
<i>Veronica jacquinii</i>	E1	.	.	27	.	.	40	20
<i>Galium purpureum</i>	E1	.	.	12	13	.	.	.
<i>Euphorbia verrucosa</i>	E1	.	.	4	.	.	90	40
<i>Centaurea bracteata</i>	E1	.	.	.	50	8	.	.
<i>Phleum phleoides</i>	E1	.	.	.	38	.	.	.
<i>Festuca rupicola</i>	E1	.	.	.	25	.	20	80
<i>Carex caryophillea</i>	E1	.	.	.	25	.	.	.
<i>Bromopsis erecta</i>	E1	.	.	.	13	8	50	90
<i>Bupleurum ranunculoides</i> subsp. <i>caricinum</i>	E1	.	.	.	13	.	.	.
<i>Scabiosa columbaria</i>	E1	.	.	.	.	38	.	.
<i>Centaurea scabiosa</i> (inc. subsp. <i>fritschii</i>)	E1	.	.	.	.	8	10	40
<i>Campanula rotundifolia</i>	E1	.	.	.	.	8	.	.
<i>Ranunculus polyanthemophyllus</i>	E1	.	.	.	.	8	.	.
<i>Scabiosa hladnikiana</i>	E1	.	.	.	.	.	80	40
<i>Centaurea pannonica</i>	E1	.	.	.	.	.	40	.
<i>Euphrasia stricta</i>	E1	.	.	.	.	.	20	.
<i>Dorycnium germanicum</i>	E1	.	.	.	.	.	10	.
<i>Linum catharticum</i>	E1	.	.	.	.	.	10	30
<i>Orchis tridentata</i>	E1	.	.	.	.	.	10	.
<i>Muscari comosum</i>	E1	.	.	.	.	.	10	.
<i>Filipendula vulgaris</i>	E1	.	.	.	.	.	.	40
<i>Thymus praecox</i> s. str.	E1	.	.	.	.	.	.	40
<i>Anthyllis vulneraria</i>	E1	.	.	.	.	.	.	40
<i>Ranunculus bulbosus</i>	E1	.	.	.	.	.	.	20
<i>Thymus longicaulis</i>	E1	.	.	.	.	.	.	30
<i>Genista tinctoria</i>	E1	.	.	.	.	.	.	10
<i>Erysimum odoratum</i>	E1	.	.	.	.	.	.	10

Successive number		1	2	3	4	5	6	7
<i>Anacamptis pyramidalis</i>	E1	.	.	.	.	.	.	10
<i>Orchis ustulata</i>	E1	.	.	.	.	.	.	10
<i>Scabiosa triandra</i>	E1	.	.	.	.	.	.	20
<i>Scorzonera austriaca</i>	E1	.	.	.	.	.	.	10
<i>Gentiana cruciata</i>	E1	.	.	.	.	.	.	10
TG Trifolio-Geranietea								
<i>Laserpitium siler</i>	E1	100	92	50	100	46	50	100
<i>Laserpitium latifolium</i> (subsp. <i>asperum</i>)	E1	68	83	100	63	8	50	60
<i>Thalictrum minus</i>	E1	68	58	81	38	38	70	.
<i>Lilium carnioolicum</i>	E1	61	42	62	.	.	.	.
<i>Polygonatum odoratum</i>	E1	55	33	73	50	23	60	30
<i>Silene nutans</i>	E1	48	17	42	25	8	40	60
<i>Iris graminea</i>	E1	45	50	96	.	15	20	.
<i>Arabis pauciflora</i>	E1	42	92	58	.	.	.	.
<i>Tanacetum corymbosum</i> agg. (<i>T. clusii</i> ?)	E1	29	67	69	.	.	.	40
<i>Vicia sylvatica</i>	E1	29	25	54	.	8	.	.
<i>Anthericum ramosum</i>	E1	26	8	42	.	31	90	30
<i>Libanotis sibirica</i> subsp. <i>montana</i>	E1	26	67	4	.	31	.	.
<i>Valeriana collina</i> (<i>V. wallrothii</i>)	E1	23	8	35	63	8	20	20
<i>Vincetoxicum hirundinaria</i>	E1	23	8	65	25	54	90	.
<i>Verbascum lanatum</i>	E1	19	25	58	.	8	.	.
<i>Clinopodium vulgare</i>	E1	16	.	35	25	8	10	.
<i>Trifolium rubens</i>	E1	16	58	85	.	15	.	.
<i>Origanum vulgare</i>	E1	10	17	8	13	.	20	.
<i>Orobanche laserpitii-sileris</i>	E1	10	.	.	.	.	.	.
<i>Achillea distans</i>	E1	6	33	88	.	15	.	.
<i>Viola hirta</i>	E1	6	.	12	13	.	.	20
<i>Thesium bavarum</i>	E1	3	25	77	13	8	60	50
<i>Digitalis grandiflora</i>	E1	3	17	15	13	8	10	.
<i>Hypericum perforatum</i>	E1	3	8	8	.	8	.	40
<i>Agrimonia eupatoria</i>	E1	3	.	.	.	.	.	.
<i>Geranium sanguineum</i>	E1	.	25	65	.	.	50	50
<i>Verbascum lychnitis</i>	E1	.	17	.	.	.	.	.
<i>Trifolium medium</i>	E1	.	8	4	.	8	.	.
<i>Campanula rapunculoides</i>	E1	.	.	19	.	.	.	.
<i>Hypericum hirsutum</i>	E1	.	.	4	.	.	10	20
<i>Inula spiraeifolia</i>	E1	.	.	.	.	8	.	.
<i>Libanotis daucifolia</i>	E1	.	.	.	.	8	.	.
<i>Tephrosia longifolia</i>	E1	.	.	.	.	.	20	30
<i>Verbascum austriacum</i>	E1	.	.	.	.	.	20	20
<i>Lilium bulbiferum</i>	E1	.	.	.	.	.	50	.
<i>Vicia cassubica</i>	E1	.	.	.	.	.	50	.
<i>Lembotropis nigricans</i>	E1	.	.	.	.	.	40	.
<i>Verbascum nigrum</i>	E1	.	.	.	.	.	20	.
<i>Coronilla coronata</i>	E1	.	.	.	.	.	10	.
<i>Trifolium alpestre</i>	E1	.	.	.	.	.	10	.
<i>Dianthus croaticus</i>	E1	.	.	.	.	.	.	70
<i>Melampyrum nemorosum</i>	E1	.	.	.	.	.	.	10
<i>Centaurea stenolepis</i>	E1	.	.	.	.	.	.	10
PoT Poo alpinae-Trisetalia								
<i>Festuca nigrescens</i>	E1	58	67	77	13	15	.	.

Successive number		1	2	3	4	5	6	7
<i>Astrantia major</i>	E1	39	17	.	.	8	10	.
<i>Traunsteinera globosa</i>	E1	39	25	31	.	8	.	.
<i>Trollius europaeus</i>	E1	32	75	4	.	38	.	.
<i>Pimpinella major</i> subsp. <i>rubra</i>	E1	23	33	.	13	.	.	.
<i>Ranunculus nemorosus</i>	E1	13	58	54	25	15	40	.
<i>Anthoxanthum odoratum</i>	E1	13	58	50	.	.	.	.
<i>Crocus albiflorus</i>	E1	13	25	15	.	.	.	.
<i>Campanula scheuchzeri</i>	E1	13	.	.	.	38	.	.
<i>Poa alpina</i>	E1	3	.	.	.	.	.	.
<i>Polygonum bistorta</i>	E1	3	.	.	.	.	.	.
<i>Agrostis capillaris</i>	E1	.	17	.	.	38	10	.
<i>Cerastium fontanum</i>	E1	.	.	.	.	8	.	.
<i>Dactylorhiza majalis</i>	E1	.	.	.	.	.	.	20
MA <i>Molinio-Arrhenatheretea</i>								
<i>Lotus corniculatus</i> s. lat.	E1	45	50	81	38	.	60	60
<i>Galium album</i> (inc. <i>G. mollugo</i>)	E1	35	58	81	.	15	20	20
<i>Dactylis glomerata</i> s.str.	E1	32	50	27	.	23	20	30
<i>Leontodon hispidus</i> subsp. <i>hispidus</i>	E1	23	17	12	.	8	20	30
<i>Trifolium pratense</i>	E1	13	17	4	25	15	.	20
<i>Lathyrus pratensis</i>	E1	10	42	12	25	23	60	50
<i>Vicia sepium</i>	E1	6	8	.	.	.	.	10
<i>Veronica chamaedrys</i>	E1	3	8	.	13	.	30	.
<i>Achillea millefolium</i> agg.	E1	3	.	.	13	.	10	20
<i>Angelica sylvestris</i>	E1	.	17	.	.	31	.	.
<i>Achillea roseoalba</i>	E1	.	8	.	.	.	.	.
<i>Tragopogon pratensis</i> subsp. <i>orientalis</i>	E1	.	.	8	.	8	.	10
<i>Vicia cracca</i>	E1	.	.	.	13	8	.	.
<i>Orobanche minor</i>	E1	.	.	.	13	.	.	.
<i>Festuca rubra</i>	E1	.	.	.	.	8	100	60
<i>Rumex acetosa</i>	E1	.	.	.	.	8	20	10
<i>Deschampsia cespitosa</i>	E1	.	.	.	.	8	.	.
<i>Stellaria graminea</i>	E1	.	.	.	.	8	.	10
<i>Leucanthemum praecox</i> et <i>L. ircutianum</i>	E1	.	.	.	.	.	30	10
<i>Prunella vulgaris</i>	E1	.	.	.	.	.	20	60
<i>Trisetum flavescens</i>	E1	.	.	.	.	.	20	10
<i>Arrhenatherum elatius</i>	E1	.	.	.	.	.	20	.
<i>Poa pratensis</i>	E1	.	.	.	.	.	10	.
<i>Geranium phaeum</i>	E1	.	.	.	.	.	10	.
<i>Centaurea jacea</i>	E1	.	.	.	.	.	.	40
<i>Plantago lanceolata</i>	E1	.	.	.	.	.	.	30
<i>Ranunculus acris</i>	E1	.	.	.	.	.	.	20
<i>Colchicum autumnale</i>	E1	.	.	.	.	.	.	20
<i>Taraxacum officinale</i> agg.	E1	.	.	.	.	.	.	10
<i>Trifolium campestre</i>	E1	.	.	.	.	.	.	10
<i>Helictotrichon pubescens</i>	E1	.	.	.	.	.	.	10
<i>Veronica serpyllifolia</i>	E1	.	.	.	.	.	.	10
CU <i>Calluno-Ulicetea</i>								
<i>Phyteuma zahlbruckneri</i>	E1	19	.	50	25	8	.	.
<i>Carex pallescens</i>	E1	3	.	.	.	.	.	.
<i>Luzula multiflora</i>	E1	3	8	.	.	.	.	.
<i>Potentilla erecta</i>	E1	.	33	77	13	15	70	70

Successive number		1	2	3	4	5	6	7
<i>Arnica montana</i>	E1	.	8	.	.	.	.	.
<i>Carex pilulifera</i>	E1	.	8	.	.	.	.	.
<i>Galium pumilum</i>	E1	.	.	35	.	.	.	.
<i>Calluna vulgaris</i>	E1	.	.	4	.	.	.	.
<i>Genista germanica</i>	E1	.	.	4	.	.	.	.
<i>Coeloglossum viride</i>	E1	.	.	4	.	.	.	.
<i>Danthonia decumbens</i>	E1	.	.	.	.	8	.	.
MuA <i>Mulgedio-Aconitetea</i>								
<i>Silene vulgaris</i> subsp. <i>antelopum</i>	E1	58	42	.	75	.	.	.
<i>Lathyrus occidentalis</i> var. <i>montanus</i> (inc. <i>L. laevigatus</i>)	E1	32	42	19	13	.	.	.
<i>Aconitum lycoctonum</i> s. lat.	E1	29	17	4	.	54	10	.
<i>Hypericum maculatum</i>	E1	23	58	27	13	23	.	.
<i>Polygonatum verticillatum</i>	E1	19	33	12	.	23	.	.
<i>Veratrum album</i> s. lat.	E1	19	42	4	.	62	.	.
<i>Pleurospermum austriacum</i>	E1	13	42	65	.	8	.	.
<i>Rumex arifolius</i>	E1	13	50	.	13	8	.	.
<i>Salix appendiculata</i>	E2	13	.	.	.	8	.	.
<i>Geranium sylvaticum</i>	E1	10	.	.	.	.	.	.
<i>Heracleum sphondylium</i> subsp. <i>montanum</i> (inc. subsp. <i>elegans</i>)	E1	10	33	12	38	23	.	.
<i>Allium victorialis</i>	E1	6	8	.	.	.	.	.
<i>Centaurea montana</i>	E1	6	.	.	.	.	.	30
<i>Aconitum angustifolium</i> (inc. <i>A. tauricum</i>)	E1	3	8	.	.	15	.	.
<i>Chaerophyllum villarsii</i>	E1	3	17	.	.	.	.	.
<i>Eryngium alpinum</i>	E1	3	8	.	.	.	.	.
<i>Myrrhis odorata</i>	E1	3	17	.	.	.	.	.
<i>Senecio ovatus</i>	E1	3	17	23	.	15	.	.
<i>Sorbus chamaemespilus</i>	E2	3	8	.	.	.	.	.
<i>Thalictrum aquilegifolium</i>	E1	3	25	8	13	.	.	30
<i>Urtica dioica</i>	E1	3	.	.	.	.	.	.
<i>Carduus carduelis</i>	E1	.	25	.	.	.	.	.
<i>Crepis pyrenaica</i>	E1	.	17	.	.	.	.	.
<i>Poa hybrida</i>	E1	.	17	.	.	.	.	.
<i>Silene dioica</i>	E1	.	17	.	.	.	.	.
<i>Aconitum degenii</i> subsp. <i>paniculatum</i>	E1	.	8	4	.	.	.	.
<i>Geum rivale</i>	E1	.	8	.	.	8	.	.
<i>Ranunculus platanifolius</i>	E1	.	8	.	.	8	.	.
<i>Pedicularis hacquetii</i>	E1	.	8	.	.	.	.	.
<i>Chaerophyllum aureum</i>	E1	.	.	4	.	.	.	.
<i>Grafia golaka</i>	E1	.	.	.	.	100	100	.
<i>Molopospermum peloponnesiacum</i> subsp. <i>bauhinii</i>	E1	.	.	.	.	31	.	.
<i>Alchemilla xanthochlora</i>	E1	.	.	.	.	8	.	.
<i>Rumex alpinus</i>	E1	.	.	.	.	8	.	.
<i>Salix glabra</i>	E1	.	.	.	.	8	.	.
<i>Stemmacantha rhapsantica</i>	E1	.	.	.	.	8	.	.
<i>Dactylis glomerata</i> subsp. <i>slovenica</i>	E1	.	.	.	.	8	.	.
<i>Cirsium waldsteinii</i>	E1	.	.	.	.	.	30	.
SCF <i>Scheuchzerio-Caricetea fuscae</i>								
<i>Gentiana utriculosa</i>	E1	3	.	.	.	.	.	30
<i>Parnassia palustris</i>	E1	3	.	.	.	.	.	.
<i>Pinguicula alpina</i>	E1	3	.	.	.	.	.	.

Successive number		1	2	3	4	5	6	7
TR	<i>Thlaspietea rotundifolii</i>							
	<i>Ligusticum seguieri</i>	E1	32	25	62	.	.	.
	<i>Biscutella laevigata</i>	E1	19	.	23	25	.	40
	<i>Viola pyrenaica</i>	E1	16	8	.	.	.	.
	<i>Adenostyles glabra</i>	E1	6	8	.	.	8	.
	<i>Rumex scutatus</i>	E1	6	.	.	.	.	.
	<i>Astrantia carniolica</i>	E1	3	.	.	.	8	.
	<i>Petasites paradoxus</i>	E1	3	.	.	.	8	.
	<i>Leontodon hispidus</i> subsp. <i>hyoseroides</i>	E1	3	.	.	.	.	.
	<i>Silene vulgaris</i> subsp. <i>glareosa</i>	E1	3	.	.	.	.	.
	<i>Euphorbia triflora</i> subsp. <i>kernerii</i>	E1	.	.	.	13	.	.
AT	<i>Asplenietea trichomanis</i>							
	<i>Primula auricula</i>	E1	19	25	12	.	.	.
	<i>Saxifraga hostii</i>	E1	16	8	.	13	.	.
	<i>Saxifraga crustata</i>	E1	10	8	.	.	.	.
	<i>Dianthus sylvestris</i>	E1	6	8	.	.	.	50
	<i>Iris pallida</i> subsp. <i>cengialti</i>	E1	6	8	.	.	.	.
	<i>Sedum album</i>	E1	6	.	.	.	.	.
	<i>Sedum maximum</i>	E1	6	8	12	.	.	.
	<i>Asplenium ruta-muraria</i>	E1	6	8	.	.	.	.
	<i>Silene hayekiana</i>	E1	3	8	.	.	.	.
	<i>Carex brachystachys</i>	E1	3	.	.	.	.	.
	<i>Festuca stenantha</i>	E1	3	.	.	.	.	.
	<i>Rhamnus pumilus</i>	E1	3	.	.	.	.	.
	<i>Asplenium trichomanes</i>	E1	3	.	.	.	.	.
	<i>Sempervivum tectorum</i>	E1	.	8	.	.	.	.
	<i>Athamanta turbith</i>	E1	.	.	4	.	.	.
	<i>Campanula spicata</i>	E1	.	.	.	13	.	.
	<i>Valeriana saxatilis</i>	E1	.	.	.	.	10	.
	<i>Hieracium glaucum</i>	E1	.	.	.	.	.	10
EP	<i>Erico-Pinetea</i>							
	<i>Chamaecytisus hirsutus</i> s. lat.	E1	71	50	54	.	.	80
	<i>Genista radiata</i>	E1	68	25	.	63	8	.
	<i>Calamagrostis varia</i>	E1	61	17	4	88	38	100
	<i>Erica carnea</i>	E1	26	25	62	63	8	100
	<i>Peucedanum austriacum</i> subsp. <i>rablense</i>	E1	42	25	4	75	8	.
	<i>Carex ornithopoda</i>	E1	10	8	23	.	.	.
	<i>Aquilegia nigricans</i> (inc. <i>A. vulgaris</i>)	E1	10	.	.	.	.	20
	<i>Rubus saxatilis</i>	E1	6	17	12	13	38	20
	<i>Polygala chamaebuxus</i>	E1	6	17	4	13	.	60
	<i>Molinia caerulea</i> subsp. <i>arundinacea</i>	E1	3	8	19	50	15	50
	<i>Leontodon incanus</i>	E1	3	.	.	.	.	70
	<i>Cotoneaster tomentosus</i>	E2	3	.	.	.	.	.
	<i>Juniperus sibirica</i>	E2	3	.	.	.	.	.
	<i>Pinus mugo</i>	E2	3	.	.	.	.	.
	<i>Chamaecytisus purpureus</i>	E1	.	.	.	38	15	.
	<i>Daphne cneorum</i>	E1	.	.	.	25	.	.
	<i>Arctostaphylos uva-ursi</i>	E1	.	.	.	13	.	.
	<i>Knautia ressmannii</i>	E1	.	.	.	13	.	.
	<i>Carex alba</i>	E1	.	.	.	.	8	.

Successive number		1	2	3	4	5	6	7
<i>Genista januensis</i>	E1	.	.	.	.	.	.	10
VP Vaccinio-Piceetea								
<i>Picea abies</i>	E2	32	17	8	.	.	.	.
<i>Aposeris foetida</i>	E1	23	58	38	.	.	30	.
<i>Calamagrostis arundinacea</i>	E1	6	25	88	.	31	.	.
<i>Luzula luzuloides</i>	E1	3	17	27	.	23	.	.
<i>Rosa pendulina</i>	E2	3	8	31	13	15	40	.
<i>Solidago virgaurea</i>	E1	.	17	.	.	.	10	.
<i>Clematis alpina</i>	E1	.	8	.	.	.	.	.
<i>Vaccinium myrtillus</i>	E1	.	8	.	.	.	.	.
<i>Veronica urticifolia</i>	E1	.	.	15	.	.	.	.
<i>Maianthemum bifolium</i>	E1	.	.	4	.	.	.	.
<i>Larix decidua</i>	E1	.	.	.	13	.	.	.
<i>Gentiana asclepiadea</i>	E1	.	.	.	.	31	.	.
<i>Hieracium sylvaticum</i>	E1	.	.	.	.	.	20	10
<i>Homogyne sylvestris</i>	E1	.	.	.	.	.	20	.
<i>Valeriana tripteris</i>	E1	.	.	.	.	.	10	.
EC Erythronio-Carpinion								
<i>Ornithogalum pyrenaicum</i>	E1	39	25	19	.	.	.	.
<i>Primula vulgaris</i>	E1	16	8	27	.	.	40	40
<i>Galanthus nivalis</i>	E1	3	8	.	.	.	.	.
<i>Helleborus odorus</i>	E1	.	25	.	.	15	10	.
AF Aremonio-Fagion								
<i>Knautia drymeia</i>	E1	48	92	58	.	62	70	40
<i>Cyclamen purpurascens</i>	E1	32	.	15	13	.	100	20
<i>Rhamnus fallax</i>	E2	10	.	.	.	.	.	.
<i>Dentaria enneaphyllos</i>	E1	3	.	.	.	.	.	10
<i>Anemone trifolia</i>	E1	.	.	.	13	.	.	.
<i>Helleborus niger</i>	E1	.	.	.	.	.	20	.
<i>Omphalodes verna</i>	E1	.	.	.	.	.	20	.
<i>Hacquetia epipactis</i>	E1	.	.	.	.	.	20	.
<i>Euphorbia carniolica</i>	E1	.	.	.	.	.	20	.
FS Fagetalia sylvaticae								
<i>Mercurialis perennis</i>	E1	71	75	58	50	31	10	10
<i>Melica nutans</i>	E1	19	.	.	.	.	.	.
<i>Symphytum tuberosum</i>	E1	16	.	58	.	8	.	.
<i>Fagus sylvatica</i>	E2	10	.	15	.	.	10	.
<i>Lilium martagon</i>	E1	10	33	23	.	38	.	.
<i>Myosotis sylvatica</i>	E1	10	17	.	.	.	.	.
<i>Luzula nivea</i>	E1	6	.	.	25	.	.	.
<i>Euphorbia amygdaloides</i>	E1	3	.	.	.	.	.	10
<i>Galium laevigatum</i>	E1	3	8	31	13	.	.	.
<i>Lathyrus vernus</i>	E1	3	.	8	.	15	.	.
<i>Poa nemoralis</i>	E1	3	.	.	13	.	.	10
<i>Salvia glutinosa</i>	E1	3	.	.	.	.	10	10
<i>Scrophularia nodosa</i>	E1	3	.	.	.	.	.	.
<i>Tilia cordata</i>	E2	3	.	.	.	.	.	.
<i>Acer pseudoplatanus</i>	E1	3	8	4	.	8	.	20
<i>Hesperis candida</i>	E1	3	.	.	.	.	.	.
<i>Campanula trachelium</i>	E1	.	8	.	.	.	.	.
<i>Lonicera alpigena</i>	E2	.	8	.	.	.	.	.

Successive number		1	2	3	4	5	6	7
<i>Prenanthes purpurea</i>	E1	.	.	12	.	.	10	.
<i>Melica nutans</i>	E1	.	.	4	.	8	60	.
<i>Heracleum sphondylium</i> subsp. <i>sphondylium</i>	E1	.	.	4	.	23	.	.
<i>Daphne mezereum</i>	E1	.	.	4	.	8	.	.
<i>Festuca heterophylla</i>	E1	.	.	4	.	.	.	40
<i>Neottia nidus-avis</i>	E1	.	.	4	.	.	.	.
<i>Luzula nivea</i>	E1	.	.	.	.	15	.	.
<i>Fraxinus excelsior</i>	E1	.	.	.	.	8	.	.
<i>Galeobdolon flavidum</i>	E1	.	.	.	.	8	.	.
<i>Laburnum alpinum</i>	E1	.	.	.	.	8	.	.
<i>Phyteuma spicatum</i>	E1	.	.	.	.	.	10	20
<i>Epipactis helleborine</i>	E1	.	.	.	.	.	10	.
<i>Galeobdolon montanum</i>	E1	.	.	.	.	.	10	.
<i>Ranunculus lanuginosus</i>	E1	.	.	.	.	.	.	10
<i>Euphorbia dulcis</i>	E1	.	.	.	.	.	.	10
QP <i>Quercetalia pubescentis</i>								
<i>Peucedanum schottii</i> var. <i>schottii</i>	E1	42	25	85	.	15	.	.
<i>Convallaria majalis</i>	E1	13	17	65	13	31	100	10
<i>Primula veris</i> subsp. <i>columnae</i>	E1	13	25	92	.	.	.	.
<i>Carex flacca</i>	E1	10	8	58	38	15	30	70
<i>Sorbus aria</i>	E2	10	17	46	.	.	.	.
<i>Melittis melissophyllum</i>	E1	6	25	81	.	.	30	.
<i>Ostrya carpinifolia</i>	E2	3	.	15	.	.	.	.
<i>Orchis mascula</i> subsp. <i>speciosa</i>	E1	.	17	12	.	.	.	.
<i>Peucedanum schottii</i> var. <i>petraeum</i>	E1	.	8	.	.	.	.	.
<i>Fraxinus ornus</i>	E1	.	.	11	.	.	10	.
<i>Hypericum montanum</i>	E1	.	.	8	.	.	.	.
<i>Arabis turrata</i>	E1	.	.	4	.	.	.	.
<i>Mercurialis ovata</i>	E1	.	.	.	.	.	100	40
<i>Clematis recta</i>	E1	.	.	.	.	.	10	30
<i>Campanula persicifolia</i>	E1	.	.	.	.	.	10	20
<i>Acer obtusatum</i>	E1	.	.	.	.	.	.	20
<i>Tamus communis</i>	E1	.	.	.	.	.	.	10
<i>Quercus pubescens</i>	E1	.	.	.	.	.	.	10
QF <i>Quercus-Fagetea</i>								
<i>Anemone nemorosa</i>	E1	16	8	27	.	.	20	20
<i>Carex digitata</i>	E1	16	17	15	13	.	40	50
<i>Listera ovata</i>	E1	13	8	8	.	.	.	.
<i>Corylus avellana</i>	E2	3	17	8	.	.	.	.
<i>Cruciata glabra</i>	E1	3	25	.	.	15	30	50
<i>Dactylorhiza fuchsii</i>	E1	3	8	27	.	15	.	.
<i>Veratrum nigrum</i>	E1	.	25	.	.	.	.	.
<i>Cephalanthera longifolia</i>	E1	.	.	42	.	.	.	.
<i>Carex montana</i>	E1	.	.	38	.	.	30	70
<i>Chamaecytisus supinus</i>	E1	.	.	4	.	.	.	.
<i>Populus tremula</i>	E1	.	.	4	.	.	.	.
<i>Platanthera bifolia</i>	E1	.	.	4	.	.	.	.
<i>Crataegus monogyna</i>	E1	.	.	4	.	.	.	.
<i>Viola riviniana</i>	E1	.	.	4	.	.	.	.
<i>Serratula tinctoria</i> subsp. <i>tinctoria</i>	E1	.	.	.	.	38	20	.
<i>Festuca gigantea</i>	E1	.	.	.	.	8	.	.

Successive number		1	2	3	4	5	6	7
<i>Betonica officinalis</i>	E1	.	.	.	.	.	50	50
<i>Hepatica nobilis</i>	E1	.	.	.	.	.	40	.
<i>Melampyrum pratense</i>	E1	.	.	.	.	.	.	10
<i>Euphorbia angulata</i>	E1	.	.	.	.	.	.	10
RP Rhamno-Prunetea								
<i>Rosa glauca</i>	E2	3	.	8	.	.	.	.
<i>Rosa canina</i>	E1	3	.	.	.	.	.	.
<i>Rhamnus catharticus</i>	E2a	.	8	.	.	.	.	.
<i>Rubus fruticosus</i>	E2	.	.	.	.	.	.	10
O Other species								
<i>Rubus idaeus</i>	E2	10	.	19	.	54	.	.
<i>Juniperus communis</i>	E2	6	8	.	.	.	.	.
<i>Fragaria vesca</i>	E1	3	.	15	13	.	80	.
<i>Hieracium</i> sp.	E1	3	.	.	.	.	.	.
<i>Poa</i> sp.	E1	3	.	.	.	.	.	.
SM <i>Myosotis arvensis</i>	E1	3	.	.	.	.	.	.
<i>Sorbus aucuparia</i>	E1	.	.	8	.	.	.	.
<i>Potentilla recta</i>	E1	.	.	.	.	15	.	.
<i>Salix eleagnos</i>	E1	.	.	.	.	8	.	.
<i>Orobancha</i> sp.	E1	.	.	.	.	.	.	10
M Mosses								
<i>Tortella tortuosa</i>	E0	10	17	.	.	.	.	.
<i>Schistidium apocarpum</i>	E0	3	8	.	.	.	.	.
<i>Fissidens dubius</i>	E0	.	8	.	.	.	.	.
<i>Polytrichum formosum</i>	E0	.	.	.	.	.	.	.

- 1: *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *typicum* – the Julian Alps, Slovenia
- 2: *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *typicum* var. *Brachypodium rupestre* – the Julian Alps, Slovenia
- 3: *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco *asphodeletosum albi* subass. nov. hoc loco – the Julian Alps, Slovenia (Dakskobler et al. 2007, table 1, rel. 8-33)
- 4: *Centaureo julici-Laserpitietum sileris* ass. nov. hoc loco var. geogr. *Pedicularis elongata*, W Julian Alps, the Carnic Alps, NE Italy
- 5: *Laserpitio sileri-Grafietum golakae* ass. nov. hoc loco, the Julian Prealps, NE Italy
- 6: *Scabioso hladnikiana-Grafietum golakae* Čarni 2007 – central Slovenia – Polhograjsko hribovje (Čarni 2007, Table 1)
- 7: *Laserpitietum sileris* Springer 1987 var. geogr. *Dianthus croaticus* – southeastern Slovenia – Gorjanci (Čarni et al. 2005, Tab. 1, rel. 47–56)

Table 6: Phytosociological groups in the tall herb and fringe communities with the dominant *Laserpitium siler* or *Grafia golaka* in NE Italy and Slovenia (relative frequencies).**Tabela 6:** Fitocenološke skupine v združbah visokih steblik in gozdnih robov z dominantnima vrstama *Laserpitium siler* ali *Grafia golaka* v severovzhodni Italiji in Sloveniji (relativne frekvence).

Successive number (Zaporedna številka)	1	2	3	4	5	6	7
Number of relevés (Število popisov)	31	12	26	8	13	10	10
Sign for the syntaxa (Oznaka sintakosnov)	CJLS1	CJLS2	CJLSaa	CJLSLP	GgLs	ShGg	Ls
<i>Caricion austroalpinae</i>	6.49	6.41	5.30	3.72	2.56	0.41	0.00
<i>Elyno-Seslerietea</i>	24.10	19.50	9.87	26.81	6.97	6.91	2.37
<i>Festuco-Brometea</i>	20.22	19.50	22.75	22.73	19.49	27.03	41.23
<i>Trifolio-Geranietea</i>	14.04	14.80	22.04	13.02	13.72	17.68	15.64
<i>Poo alpinae-Trisetalia</i>	4.76	6.27	3.05	1.51	6.33	1.22	0.47
<i>Molinio-Arrhenatheretea</i>	3.28	4.60	3.79	4.13	6.14	9.15	13.27
<i>Calluno-Ulicetea</i>	0.49	0.97	3.77	1.12	1.17	1.42	1.66
<i>Mulgedio-Aconitetea</i>	5.33	9.60	3.06	4.87	16.06	2.85	1.42
<i>Scheuchzerio-Caricetea fuscae</i>	0.19	0.00	0.00	0.00	0.00	0.00	0.71
<i>Thlaspietea rotundifolii</i>	1.79	0.70	1.43	1.12	0.90	0.81	0.00
<i>Asplenieta trichomanis</i>	1.79	1.53	0.47	0.77	0.00	0.20	1.42
<i>Erico-Pinetea</i>	6.10	3.20	3.06	13.40	5.20	8.74	4.03
<i>Vaccinio-Piceetea</i>	1.30	2.65	3.55	0.77	3.77	2.64	0.24
<i>Erythronio-Carpinion</i>	1.11	1.11	0.77	0.00	0.57	1.02	0.95
<i>Aremonio-Fagion</i>	1.79	1.53	1.23	0.77	2.34	5.08	1.66
<i>Fagetalia sylvaticae</i>	3.28	2.65	3.86	2.98	6.71	2.64	3.32
<i>Quercetalia pubescentis</i>	1.86	2.37	8.03	1.51	2.30	5.89	4.98
<i>Quercu-Fagetea</i>	1.05	1.81	3.12	0.38	2.86	4.67	6.16
<i>Rhamno-Prunetea</i>	0.12	0.14	0.13	0.00	0.00	0.00	0.24
Other species (Druge vrste)	0.56	0.14	0.71	0.38	2.90	1.63	0.24
Mosses (Mahovi)	0.25	0.55	0.00	0.00	0.00	0.00	0.00
Total (Skupaj)	100	100	100	100	100	100	100

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- 7: *Laserpitietum sileris* Springer 1987 var. geogr. *Dianthus croaticus* – southeastern Slovenia – Gorjanci (Čarni et al. 2005, Tab. 1, rel. 47–56)

Table 7: Two stands with *Grafia golaka* on its classical locality under the Mt. Golaki (the Trnovski gozd plateau, W Slovenia).

Tabela 7: Dva sestoja z vrsto *Grafia golaka* na njenem klasičnem nahajališču pod Golaki (Trnovski gozd, zahodna Slovenija).

Number of relevé		1	2	
Working number of relevé		241068	241069	
Altitude in m		1390	1400	
Aspect		SW	SSE	
Slope in degrees		30	30	
Parent material		A	A	
Soil		Li	Li	
Stoniness in %		90	50	
	Cover of tree layer in %	E3	5	.
	Cover of shrub layer in %	E2	40	.
	Cover of herb layer in %	E1	20	50
Number of species			33	22
Relevé area		m ²	200	100
Date of taking relevé			6/21/2011	6/21/2011
Locality			Veliki Golak	Veliki Golak
Quadrant			0049/1	0049/1
	Coordinate Y (Gauß-Krüger, D 48)	m	413255	413174
	Coordinate X (Gauß-Krüger, D 48)	m	5093056	5093092
MuA	Mulgedio-Aconitetea			Pr.
	<i>Grafia golaka</i>	E1	2	4
	<i>Salix appendiculata</i>	E2b	3	.
	<i>Salix appendiculata</i>	E2a	1	+
	<i>Geranium sylvaticum</i>	E1	+	+
	<i>Thalictrum aquilegifolium</i>	E1	.	+
TG	Trifolio-Geraniea			
	<i>Laserpitium latifolium</i>	E1	+	2
ES	Elyno-Seslerietea			
	<i>Betonica alopecuros</i>	E1	+	+
CA	<i>Gentiana lutea</i> subsp. <i>symphyandra</i>	E1	+	.
	<i>Scabiosa lucida</i> subsp. <i>stricta</i>	E1	+	.
FB	Festuco-Brometea			
	<i>Buphthalmum salicifolium</i>	E1	+	1
	<i>Cirsium erisithales</i>	E1	+	+
	<i>Carlina acaulis</i>	E1	.	+
EP	Erico-Pinetea			
	<i>Calamagrostis varia</i>	E1	+	1
	<i>Rubus saxatilis</i>	E1	+	+
	<i>Rhododendron hirsutum</i>	E2a	3	.
	<i>Erica carnea</i>	E1	+	.
AF	Aremonio-Fagion			
	<i>Cyclamen purpurascens</i>	E1	+	+
	<i>Omphalodes verna</i>	E1	+	.
	<i>Knautia drymeia</i>	E1	.	1
FS	Fagetalia sylvaticae			
	<i>Symphytum tuberosum</i>	E1	+	+
	<i>Acer pseudoplatanus</i>	E2a	+	.
	<i>Acer pseudoplatanus</i>	E2b	+	.
	<i>Acer pseudoplatanus</i>	E1	.	+
	<i>Actaea spicata</i>	E1	+	.

Number of relevé		1	2	Pr.	
	<i>Fagus sylvatica</i>	E2a	+	.	1
	<i>Lonicera alpigena</i>	E2a	+	.	1
	<i>Tilia platyphyllos</i>	E3	r	.	1
	<i>Viola reichenbachiana</i>	E1	+	.	1
	<i>Dryopteris filix-mas</i>	E1	r	.	1
	<i>Lilium martagon</i>	E1	.	+	1
	<i>Melica nutans</i>	E1	.	+	1
	<i>Phyteuma spicatum</i> subsp. <i>coeruleum</i>	E1	.	+	1
QP	<i>Quercetalia pubescentis</i>				
	<i>Melittis melissophyllum</i>	E1	+	+	2
QF	<i>Quercio-Fagetea</i>				
	<i>Anemone nemorosa</i>	E1	.	1	1
VP	<i>Vaccinio-Piceetea</i>				
	<i>Rosa pendulina</i>	E2a	1	.	1
	<i>Gentiana asclepiadea</i>	E1	+	.	1
	<i>Picea abies</i>	E3	+	.	1
TR	<i>Thlaspietea rotundifolii</i>				
	<i>Adenostyles glabra</i>	E1	1	+	2
	<i>Hieracium bifidum</i>	E1	r	.	1
AT	<i>Asplenieta trichomanis</i>				
	<i>Paederota lutea</i>	E1	1	1	2
	<i>Asplenium ruta-muraria</i>	E1	+	.	1
M	Mosses				
	<i>Ctenidium molluscum</i>	E0	+	.	1
	<i>Tortella tortuosa</i>	E0	+	.	1

A Limestone

Li Lithosol